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OFFICIAL TRANSCRIPT OF PROCEEDINGS

BEFORE THE
ENVIRONMENTAL PROTECTION AGENCY

VOLUME II

DOCKET No. _____

In the Matter of PUBLIC HEARING ON PROPOSED STANDARDS FOR
INORGANIC ARSENIC EMISSIONS

Place Tacoma, Washington

Date November 3, 1983

Pages 1 - 283
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for Record, 284-315

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A F F I D A V I T

In the Matter of: PUBLIC HEARING ON PROPOSED STANDARDS
FOR INORGANIC ARSENIC EMISSIONS

DATE AND PLACE VOLUME II- November 3, 1983
Tacoma, Washington

As Official Reporter to the Environmental
Protection Agency, the undersigned swears and affirms
that the foregoing transcript contains all the facts
and matters occurring therein, to the best of my
ability.

Allan M. Johnson
ALLAN M. JOHNSON, CVR

CASCADE REPORTING COMPANY
820 Securities Building
Seattle, Washington 98101

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BEFORE THE ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:

PUBLIC HEARING ON PROPOSED
STANDARDS FOR INORGANIC
ARSENIC EMISSIONS

VOLUME II

Bicentennial Pavillion
1313 Market Street
Tacoma, Washington
November 3, 1983

Met, pursuant to notice, at 9:00 o'clock, a.m.

BEFORE:

JAMES MOORE, Esq., Hearing Officer

THEODORE ROGOWSKI, Esq., Alternate Hearing Officer

C O N T E N T S

PANEL MEMBERS

Alexandra Smith, Director, Air & Waste Division
Gary O'Neal, Director, Environmental Services Division
Clark Gaulding, Chief, Air Programs Branch
Mike Johnston, Chief, Air Operations Section
Wayne Grotheer, Engineer
Jim Barnes, EPA General Counsel
Earl Salo, Office of General Counsel
David R. Patrick, Chief, Pollutant Assessment Branch
John O'Connor, Chief, Economic Analysis Branch
Al Vervaert, Environmental Engineer
Todd Thorslund, Biostatistician
Dana Daroh

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P R O C E E D I N G S

HEARING OFFICER ROGOWSKI: Welcome to this hearing. We will have the panel now introduce themselves.

MR. SMITH: I am Alexandra Smith, Director of the Air and Waste Division, Seattle.

MR. BARNES: I am Jim Barnes, General Counsel, EPA.

MR. VERVAERT: Al Vervaert, Environmental Engineer.

MR. THORSLUND: I am Tod Thorslund, Biostatistician, Carcinogenic Group.

MR. O'CONNOR: Chief, Economic Analysis Branch, EPA.

HEARING OFFICER: Before calling witnesses, let me indicate about your testimony. Since we have had over 100 individuals testify during the course of the two or three days we are going to run, it may be useful in certain circumstances to simply relay to others who have testified on the same subject matter that you've testified relating to them by reference and asking that their testimony be incorporated as your own. That way you need not repeat all the same material. You will shorten the hearing time. If you wish you can give your written testimony for the record and the panel will accept your testimony and

1 your statement as though it was completely given, since
2 each member of the panel will be given a complete record
3 before making their decision in the record to the
4 administrator in this matter.

5 Now proceeding this way, we can expedite these
6 hearings without losing the meaning of your testimony and
7 can pretty well stay on schedule. At the present time we
8 will begin with our witnesses. I would like to call again
9 the first registered, Lincoln Polissor.

10 Very good. Thank you, Mr. Polissor.

11 MR. POLISSOR: I am Lincoln Polissor from
12 the University of Washington, in the Fred Hutchinson
13 Cancer Research Center. I have a couple of simple points
14 to make this morning. I was invited by a couple of groups
15 to come and that's why I am here. I don't have a personal
16 position on the air standards but I would like to provide
17 some information that may be useful.

18 (SLIDE SHOWN)

19 Some time ago I did a study of the smelter,
20 looking for cancer risks. I'll briefly describe that study
21 and then tell why I feel that at this point we can't really
22 detect any health risks from the smelter. That doesn't
23 mean that there are none; the power of the study to detect
24 them is extremely limited.

25 This first slide which you probably can't see

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1 because the room is very bright shows the cancer
2 incidence rates in Pierce County for males and females.
3 I'll refer to the titles. Lung cancer incidence rates
4 Pierce County and Northwest Washington for the years 1974
5 to '80 and as you can see, the rates are very similar
6 both in males and females on the left-hand side of the scale.
7 The rate of 100,000 per year. There is a slight difference
8 between the male rate for Pierce County, which is near the
9 smelter, and other Northwest Washington Counties but that
10 difference is greatly explained by chance. I see no reason
11 for people to believe that that smelter is causing that
12 difference in the cancer rates.

13 (SLIDE SHOWN)

14 When we did our initial study in 1974 and '78
15 actually, we didn't have any idea of what was going to turn
16 up. Basically we took all of the transference studies
17 of cancer incidence around the Tacoma spector and we looked
18 at nearly 14,000 cancer cases in Pierce and other counties
19 covering about 1.5 million population and we classified
20 exposures to the population as small, medium or high on
21 a couple of different bases. One was distance from
22 smelter and the other was on diffuse modeling, that is
23 estimating, using meteorologic information how much people
24 in each sensor trap around the smelter would be exposed
25 to the arsenic that is emitted. Then we calculated the

1 risk according to those categories and exposure by the
2 cancer risk for those different populations and exposure.
3 This was included in lung cancer.

4 O.K., next slide please.

5 (SLIDE SHOWN)

6 Now this is on results. No excess cancer risk
7 from the smelter stands out from chance fluctuations.
8 Again I want to emphasize that this does not mean that there
9 is no risk, it just means that in this study we could not
10 detect any example of the 36 risks that we calculated
11 as to various combinations of cancer or type of cancer,
12 lung, colon, pancreas or so on, only five showed a cancer
13 risk that increased with increasing exposure to the smelter.
14 Lung cancer was not among those five and for comparison
15 of the six associations like that showing increasing risks
16 with increasing exposure, we would expect--sort of the
17 bottom line is to sort out the result from chance
18 fluctuation.

19 (SLIDE SHOWN)

20 Here is an example. The title is risk pattern
21 for nine cancers in relation to high exposure to the
22 smelter. On the left-hand side it shows cancer risks
23 expressed as the ratio to background cancer rates, so if
24 you have a medium exposure area, the first one is lung
25 cancer. We took as a background the cancer rates in the

1 lowest exposure area, beyond six miles from the smelter.
2 We took that as one. So as you move closer to the smelter
3 into the medium exposure area, the cancer risks went up
4 and as you moved even closer into the high exposure area,
5 the cancer rates went down, lung cancer, which of course
6 is not a relationship that makes any sense if decreasing
7 doses can cause increasing risks. For these months, the
8 results of this example are imprecise, some increasing risk
9 and some decreasing risks.

10 For example, the prostate, you take this. If
11 you feel it is not due to chance, if you want to avoid
12 prostate cancer, for example, you should move as close
13 as you can to the smelter, which again doesn't make sense.
14 So these findings are just chance fluctuations. So we're
15 just showing this to show that even rather dramatic
16 increases in risks with increasing exposure can still be
17 due to chance.

18 Next slide please.

19 (SLIDE SHOWN)

20 The title of this is lung cancer incidence rates
21 in Pierce County. Now this is cancer rates in Pierce County.
22 The bottom of the scale is chopped off. It doesn't start
23 at zero. It shows quite a wide fluctuation in increasing
24 cancer rate. In fact, the number of cancers per year
25 per 100,000 did rise and fluctuate but again I would like

1 to point out that these relatively dramatic changes of
2 10 percent are consistent with chance fluctuation.

3 Next slide please.

4 (SLIDE SHOWN)

5 Now here is another process defeating our effort
6 to detect health effects and that is migration. People
7 move around and this schematic diagram, including moving
8 around over time, here's a couple of folks, Joe and Mary,
9 they live in Tacoma in the 1960's and they're exposed to
10 the smelter and we want to see what kind of effects that
11 had on them but by 1980 Joe and Mary have moved away and
12 Cretchen and Phil have moved in so in looking at cancer
13 the question is, if Phil has cancer, did it come from some
14 other source. It is very unlikely that the smelter or
15 arsenic could be producing that cancer in these people.
16 So, people move around and their exposure goes with them.
17 So all people in Tacoma now, of those only a very small
18 part of them have been there over this ten-year period.

19 Next slide, please.

20 (SLIDE SHOWN)

21 Here's a migration chart of the state and
22 Tacoma. For example, using the 1980 census, look at the
23 families in Tacoma, only 18 percent of them have been
24 living there for more than 20 years. Cancer is a disease
25 with a latent period and you expect it to take 20 or 30,

1 even 40 years to show up. So here we're looking at a
2 current population that is not exposed or if they have
3 been, they haven't been living long enough to show the
4 effects of the exposure.

5 (SLIDE SHOWN)

6 Now both migration and chance fluctuation
7 are important to our studies in even detecting a small
8 risk. The sum of all this is what size of a study in
9 Tacoma would be needed to show the area cancer risk.
10 For example, 8,000 lung cancer patients and 8,000 control
11 persons, for a total of 16,000, taken from the Tacoma
12 area still could detect only a 10 percent increase in
13 cancer risk and with the chance fluctuations and migration
14 that we have in this area. Now of course this a very
15 expensive study, two or three million dollars. And,
16 even more difficult that that is the fact that Tacoma
17 produces only 88 or so, 90 to 100 lung cancer cases per
18 year, so you would need almost 100 years of accumulation
19 of cases before you could really begin to detect even a
20 10 percent risk.

21 Next slide please.

22 (SLIDE SHOWN)

23 This schematic, called detection power of past
24 studies, illustrates the problem. Our studies have a
25 capacity to detect a risk which is schematically presented

11

1 as a large block of X's on the bottom and the health
2 risk is there is depicted as a single X at the top.
3 So, we just do not have a capacity of having the studies
4 to detect small risks from the smelter at this time.

5 Thank you very much.

6 HEARING OFFICER: Any questions from the
7 panel?

8 MS. SMITH: I would like to ask this
9 question. Could you explain or clarify where your subjects
10 came from for the cancer cases that you saw? Are those
11 hospital entrances or are those death certificates?

12 MR. POLISSOR: These are hospital diagnoses.
13 We have a very good coverage in Northwest Washing. It is
14 less than 2 percent of all the cancer cases so we have
15 abstractors who go to hospitals and abstract records from
16 cases and put them in the diagnoses.

17 MS. SMITH: So it is all from hospitals
18 and you keep the cancer registry at Hutchinson Center?

19 MR. POLISSOR: That's right.

20 MS. SMITH: Also I was interested in your
21 comments on the statistics associated with the studies.
22 I was trying to get one thing straight. Something that
23 somebody told me once, that they weren't sure that with
24 a population the size of Tacoma that it was statistically
25 valid to perceive excess cancer rates, is that kind of

1 what you were studying?

2 MR. POLISSOR: I was saying that the
3 risk would have to be quite large to really detect it in
4 a population the size of Tacoma over a short period of
5 time. We usually do these studies in a period of several
6 years.

7 MR. THORSLUND: The size of the risk that
8 you could detect is much larger than the risks that are
9 being predicted by the EPA model, is that right?

10 MR. POLISSOR: That's right. The size of
11 the risk which I could have detected with my study and
12 I feel all the cancer studies to date could detect, would
13 have to be much larger than has been predicted.

14 HEARING OFFICER: Thank you very much.

15 Roger VanGoren, please.

16 MR. VANGOREN: I am Roger VanGoren speaking
17 on behalf of the Association of Washington Businesses.
18 The Association is a voluntary state-wide business
19 association committed to maintaining a health private
20 enterprise economy. We wish to submit the following
21 statement on the Arsenic Emission Standards applicable to
22 the Tacoma smelter.

23 We support the use of the very best scientific
24 methods for examining the problem and appraising the risks.
25 We believe that scientific information should be verifiable

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1 and subject to peer review within the scientific
2 community.

3 Beyond the scientific questions, we have
4 identified other areas which deserve emphasis.
5 Makers of public policy are undoubtedly under pressure to
6 protect the public health to the maximum extent, i.e.
7 zero emissions. We urge them to consider, however, two
8 factors: that the zero risk is probably unattainable.
9 Every step in that direction costs more, usually a lot
10 more, than the previous step and the benefits are harder
11 to quantify.

12 The second factor is that part of the price
13 for reduced risk could be the loss of jobs for up to
14 1,500 Tacomans. Although I don't know how tough a
15 regulation has to be to cost these people their jobs, there
16 is a point beyond which compliance means closing.

17 We strongly urge EPA to obtain the best scientific
18 data available and on the basis of that data to weigh the
19 benefits of tighter regulations against the potentially
20 high costs to the community.

21 Thank you for the opportunity to present this.

22 HEARING OFFICER: Any questions from the
23 panel?

24 (No response.)

25 HEARING OFFICER: Next we will have

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1 Chuch O'Donahue please.

2 MR. O'DONAHUE: Good morning, my name
3 is Chuch O'Donahue and I am the Business Agent for
4 United Steelworkers of America, Local 25 at the Tacoma
5 ASARCO Smelter. I am here today, as we have been in the
6 past, to say a few words about how we feel on this
7 proposed standard.

8 First of all, I'm no scientific genius who can
9 tell if low levels of arsenic will or will not kill you.
10 I believe we have already heard enough about this issue
11 anyway, and it always comes out the same way. Yes, it
12 does; no, it doesn't.

13 If you took 27 scientific geniuses, 14 would tell
14 you yes and 13 would tell you no. But that's not what
15 we're here for. I believe the issue has been pushed into
16 jobs versus health by both the EPA and the press.

17 That should not be the question at all, because
18 the Steelworkers believe we can have both, jobs for my
19 members and health for those who live in Pierce County.
20 What we see as the real question here is, "Is there a health
21 risk to anyone?" If si, what can be done to eliminate it?

22 I, myself, don't know if there really is any risk
23 to the people of the area from low levels of arsenic
24 emissions. But, if there is, then what the EPA, ASARCO
25 and those of us here today should be doing is to see that

1 any and all health risks are indeed eliminated.

2 We feel that the proposed regulation for arsenic
3 emissions is in fact one that can bring about a lower health
4 risk to those in the area while this proposal is really
5 nothing new and is, in fact, part of the PSAPCA's board
6 order issued on November 11, 1981, which in itself calls
7 for secondary air hoods to be installed by early 1984, and
8 is also part of the Steelworkers tripartite agreement
9 between themselves, OSHA and ASARCO.

10 The installation of those hoods has now come
11 to a stop on the other converters because the EPA will not
12 approve the prototype that has already been installed on
13 number four converter, as the best BAT, even though their
14 press releases say that it is indeed the best BAT available
15 at this time. While we stand here today talking about
16 the problem, work could be going on to bring the total
17 emissions from the ASARCO plant even lower. We find this
18 delay uncalled for and feel that any standard should call
19 for those hoods to be installed immediately, not after the
20 standard becomes effective in March, 1984. To do other
21 than this would only require the public to be placed under
22 an unnecessary health risk when it could be eliminated by
23 such action today; a health risk we're not sure is even
24 there, but which can be lowered by the installation of
25 those hoods.

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1 By such an order, the EPA would be taking
2 the first step to safeguard the public's health as called
3 for under Section 112 of the Clean Air Act. It should
4 not stop there. The EPA must require that ASARCO meet all
5 parts of standards today and go forward with research to
6 help reduce the emissions of arsenic within a short period
7 of time, while allowing for any recovery of their investment
8 also.

9 One other subject I want to talk about is the
10 health questionnaire which the membership of Local 25 did
11 in the town of Ruston and the North end of Tacoma.
12 We have over 1,250 of those questionnaires to turn in
13 to you today. What we found is that only 135 of those who
14 answered thought the smelter was an out and out health
15 risk to them or members of their family. Another 45 did
16 not know if it was or not, while 1,070 said there was
17 no health risk at all. Of those same 135, some 93 still
18 grow vegetables and fruits and of the 1,070, 852 of them
19 do.

20 There are no scientific facts to be drawn from
21 these surveys, only that more than 85 percent of those
22 questioned feel there is no health risk to them. What I
23 believe the EPA must do is to assure those who have some
24 questions of the health risk that everything that can be
25 done is being done. The question is not jobs versus health.

17

1 I know that we can have both. The fight should end and
2 the war to clean up what may be a health risk should begin,
3 not today, but yesterday. Put away all the red tape.
4 Put away all the paper work. Stop the media circus and
5 let's get on with what you are under court order to do.
6 Provide an ample margin of safety for the public while
7 also protecting my 570 members' jobs.

8 I thank you on behalf of Steelworkers Local 25
9 and I wish to state that you safety people have been
10 very cooperative and I am very happy that this particular
11 hearing has gone on. Thank you.

12 HEARING OFFICER: Thank you, Mr. O'Donahue.

13 MR. O'DONAHUE: Mike Wright, the Industrial
14 Hygienist from the Pittsburgh office, is also here to
15 testify.

16 HEARING OFFICER: Now it helps the court
17 reporter if you have a spare copy of your written statement.
18 Just give it to the reporter at the beginning of the
19 testimony.

20 MR. WRIGHT: I would like to second what
21 Chuck said about thanking EPA for these hearings. I've
22 worked on a couple of committees that looked at health
23 and safety problems in foreign countries and there is
24 nothing like this kind of democratic process and I'd
25 like to compliment you all.

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1 My name is Mike Wright. I am an Industrial
2 Hygienist for the United Steelworkers of America. Our
3 union represents the workers in the Tacoma Smelter and most
4 other U.S. and Canadian copper smelters.

5 The USWA has been involved in arsenic regulation
6 since the early 70's. I have personally visited and
7 studied arsenic controls in the five domestic smelters
8 with the highest content of arsenic in their feed:
9 Kennecott's Smelters in Garfield, Utah and McGill Nevada;
10 and ASARCO's in El Paso, Texas; Hayden, Arizona and of
11 course, here in Tacoma. I have also visited the smelter
12 operated by Boliden Metall in Northern Sweden which, like
13 Tacoma, is a producer of arsenic trioxide and metallic
14 arsenic. I am a co-author of the engineering reports and
15 SONIA Compliance Agreements which require specific arsenic
16 controls for the three ASARCO copper smelters and two
17 of ASARCO's lead plants. I participated in last year's
18 OSHA hearing which considered the mathematical estimates
19 of the risk of lung cancer caused by arsenic. Finally
20 I was a member of a panel chartered several years ago
21 by the U.S. Congress to evaluate the methods available
22 for assessing cancer risks for the environment.

23 Our union has a great deal to say about this issue
24 but this is not the time or place for a detailed technical
25 statement. It is not possible to deliver such a statement

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1 in ten minutes, and EPA apparently is still in the
2 process of revising the model and estimates on which we
3 are expected to comment. We will submit a lengthier and
4 more technical written statement before the record closes.
5 For now, I would like to share with you our general
6 feelings on the arsenic issue, confined primarily to
7 policy issues.

8 First, no one has to convince our union that
9 arsenic, at high levels, is risky. We know what arsenic
10 has done to too many of our union brothers and sisters in
11 the Tacoma Smelter and other copper smelters. It was the
12 deaths of our members which provided the conclusive
13 evidence that arsenic causes lung cancer.

14 One result of that finding was a decade-long
15 struggle to establish a tough new OSHA regulation for
16 arsenic. That fight was led by the Steelworkers and
17 especially by our members in the Tacoma Smelter.
18 OSHA did issue a new arsenic standard in 1978, cutting
19 the allowable level of arsenic in workplace air by 98 per-
20 cent, from 500 ug/m^3 to 10 ug/m^3 . Unfortunately, we
21 are still defending that standard in the federal courts
22 but it has already made an enormous difference in the Tacoma
23 and other smelters. Ventilation systems have been installed,
24 work practices, training and preventive maintenance have
25 all been improved and ASARCO has greatly upgraded its

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1 program for respirators and other protective equipment.
2 Most important, we signed last year a series of agreements
3 between ASARCO, the Steelworkers and OSHA which specify
4 in detail a series of engineering controls which ASARCO
5 is obligated to install and others which ASARCO is
6 obligated to research in cooperation with the union and
7 OSHA, over the next 3½ years, in order to reduce worker
8 exposure to arsenic in Tacoma and four other ASARCO plants.
9 Many of those controls will also reduce the levels of
10 arsenic emitted into the community. Some of them go beyond
11 what EPA has proposed in its arsenic regulation. We will
12 return to that point in a moment.

13 As I said, no one has to convince the Steelworkers
14 Union that arsenic causes cancer at high levels of exposure
15 in the workplace. In fact, our problem has been to
16 convince OSHA and the federal courts. But the issue
17 here is determining the risk at low levels of exposure
18 in the community -- thousands of times lower than worker
19 exposure before the new OSHA Standard. You have already
20 heard health experts from ASARCO claim that low levels
21 of arsenic pose no risk at all. We hope they are right
22 but no one knows for sure. Many scientists believe that
23 any carcinogen should be assumed to pose some risk at
24 low levels, although the risk certainly decreases as the
25 exposure decreases. Studies of the Tacoma area and of

1 neighborhoods around other copper smelters have shown no
2 detectable issues in lung cancer. But it simply is not
3 possible, using the scientific methods available today,
4 to detect one or two additional cancer cases over the
5 background rate of cancer that exists in every community,
6 with or without a copper smelter, as Dr. Polissor pointed
7 out in the previous presentation.

8 In such a situation the only prudent policy is
9 to regulate arsenic as if it does pose a risk at low levels.
10 If we have to err, let it be on the side of safety.
11 Fortunately, it is possible to make some reasonable
12 estimates about the magnitude of the risk, if a risk
13 exists at all. EPA did that through an air pollution model
14 of the smelter and the Tacoma area. That model began
15 with EPA's estimates of arsenic emissions from various
16 sources inside the plant and from the stack. The model
17 then predicted certain levels of airborne arsenic in
18 neighborhoods within a 20 kilometer radius.

19 We came to these hearings prepared to question
20 EPA's air pollution model on several grounds. First, EPA's
21 estimates of arsenic emitted from the plant were consider-
22 ably higher than the estimates made by ASARCO. Finally,
23 EPA's estimates of airborne arsenic in the community were
24 much higher than what was found by actual sampling. In
25 some cases, EPA estimated 30 ug/m^3 where the sampling

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1 found 1 or 2. A little of that can be explained by
2 differences in sampling technique, but not a difference
3 of thirty times. This is not to criticize the staff of
4 EPA who did the actual work. The administration delayed
5 so long in issuing a proposed arsenic regulation that,
6 when the federal court finally ordered it, EPA had only a
7 few months to complete the work. In fact, EPA has now
8 revised its estimate of arsenic emissions from the smelter
9 from 311 tons per year to 115 tone. While we have not
10 reviewed the estimate in detail, it seems to be more
11 realistic.

12 The results of EPA's air pollution model are
13 important because they become the input for another
14 mathematical exercise called quantitative risk assessment,
15 which attempts to calculate possible cancer rates at the
16 levels of arsenic predicted in the community. Quantitative
17 risk assessment is a very inexact procedure, little
18 more than educated guessing. That is because it attempts
19 to estimate risks to the general public at low levels of
20 arsenic, based on studies of workers exposed 30 years ago
21 to levels thousands of times higher. Obviously a lot of
22 assumptions are involved. It is safer to overstate the
23 risk than to understate it, so at every step we assume
24 the worst; given a choice between two assumptions, we
25 adopt the one which tends to raise the cancer risk, not

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1 lower it. Therefore the final results is an upper bound.
2 The risk may well be lower; it may in fact be zero.
3 Using this lengthy, complicated and inexact procedure,
4 the EPA estimated that between 1.1 and 17.6 arsenic-related
5 cancer deaths could occur each year among the 370,000
6 people living within 20 kilometers of the smelter, if
7 ASARCO were to install no controls. That risk would be
8 reduced to between 0.2 and 3.4 cases per year were ASARCO
9 to complete the secondary converter hoods. Remember, these
10 risks were upper bounds. Furthermore, EPA's calculations
11 were based on its July estimates of arsenic emissions
12 from the plant and EPA has now cut that estimate by more
13 than 60 percent. It is likely that the risk estimates will
14 be reduced accordingly.

15 In the July Federal Register Notice the
16 Administrator of EPA requested public comment on whether
17 the residual health risks after the installation of
18 secondary hooding are "unreasonable." We believe that any
19 risk of cancer, even a hypothetical one, is unreasonable
20 if it can be avoided without creating greater risks. In
21 the Federal Register Notice EPA proposed two alternative
22 methods for reducing potential risks from arsenic, requiring
23 best available technology or forcing the smelter to close.

24 With respect to that second option, forcing the
25 smelter to close, you have already heard many of the

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1 economic arguments dealing with the effect on unemploy-
2 ment, on the tax base and on the copper industry generally.
3 I would like to focus for a moment on the health risks of
4 forcing the smelter to close. We know that unemployment
5 is itself a health hazard, resulting in heart disease,
6 stroke, suicide and other stress-related illnesses.
7 There are limited scientific studies which allow us to
8 estimate the health risk from a given rise in unemployment
9 much as we estimate the risks from arsenic. EPA has
10 predicted a 1 percent rise in the Pierce County unemploy-
11 ment rate if the smelter closes. Based on the available
12 studies, we estimate that a 1 percent rise in unemployment
13 could cause 84 deaths in Pierce County over a six-year
14 period. That is a considerably greater risk of death
15 than what EPA predicts from arsenic after the installation
16 of secondary hooding. We have heard a great deal of
17 debate over what Congress meant by the phrase "ample margin
18 of safety," but surely they did not mean that the net effect
19 of an EPA control strategy should be a rise in the death
20 rate. We will, of course, try to refine this risk
21 estimate and provide you with the supporting documentation
22 by the December deadline.

23 In addition we should consider the fact that
24 Tacoma is the only domestic producer of arsenic products
25 and the only domestic smelter capable of smelting high

1 arsenic concentrates. If Tacoma closes, those concentrates
2 will go to some foreign smelter, probably one in a less-
3 developed country, with little or no pollution controls.
4 The arsenic products will then be imported into the
5 United States. EPA, of course, has no mandate to consider
6 health risks to citizens of other countries, but, as
7 human beings, we should all consider the morality of
8 attempting to solve our problems by giving them to
9 someone else.

10 That leaves the other option, the installation of
11 the best available technology. That should begin with the
12 secondary converter hooding specified in the EPA proposal.
13 In fact, the secondary hooding is also required by
14 PSAPCA, and by the tripartite OSHA Compliance Agreement
15 between the company, our union and the government.
16 Unfortunately, installation is now behind schedule because
17 EPA has not yet approved the design. I hope EPA will
18 quickly allow that project to go forward.

19 Best available technology need not end with
20 secondary converter hooding. Much of the arsenic emitted
21 by the plant comes from fugitive emissions. Controls
22 for many of these sources are specified in our tripartite
23 OSHA Compliance Agreement. Other fugitive controls may
24 also be possible. Some participants have recommended
25 the temporary curtailment of operations based on the

1 exceedence of some ambient standard, adverse weather
2 conditions or some other criteria. We certainly believe
3 that the smelter should curtail during the failure of any
4 control equipment and we support the concept of curtail-
5 ment generally, but we are not sure whether curtailment
6 based on sampling or weather conditions would be feasible
7 or effective and we believe EPA should look closely at the
8 available evidence before making a final decision. We
9 intend to do the same.

10 There are two other long-range controls which
11 cannot yet be considered available technology but which
12 show great promise for the future. The first such control
13 is a flash smelting furnace which would replace the
14 existing roasters and reverbatory furnace. Such a furnace
15 would provide much better controls of fugitive emissions
16 and allow more effective treatment of process gas.
17 ASARCO is currently installing a flash smelting furnace
18 at Hayden. The company's agreement with us and with
19 PSAPCA obligate them to test that furnace with high arsenic
20 concentrate for possible application in Tacoma.

21 The other possible long range control is an
22 alternate technology for producing arsenic trioxide and
23 metallic arsenic. I have seen one such process at the
24 Boliden Smelter in Sweden, a wet leaching process which
25 virtually eliminates fugitive emissions from the arsenic

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1 plant. There are technical problems in adapting that
2 particular process to Tacoma concentrates, but it might be
3 possible to modify the process or install some other
4 process at Tacoma. The company is obligated under the
5 tripartite agreement to research such technologies.

6 We believe EPA should also require research
7 into flash smelting and alternate methods of arsenic
8 production. When and if such improvements are shown to
9 be feasible, they should be required. We recognize that
10 such technologies are expensive and we would support
11 appropriate tax and other economic incentives if the cost
12 is beyond the company's resources. That, of course, would
13 require action by Congress and by the state.

14 Let me close with a simple statement about how
15 the union sees this issue. Unfortunately, the press and
16 the public have too often seen it as a question of jobs
17 versus health. Some of that, quite frankly, was created
18 by the language of the EPA Federal Register Notice.
19 Jobs versus health is not the issue; the issue is jobs
20 and health versus neither. That is an issue which goes
21 far beyond EPA's arsenic regulation. The real question is
22 whether our nation has the will to provide safe working
23 conditions, a healthy environment and economic security
24 for its citizens. If we cannot do that in Tacoma, we
25 cannot expect to do it anywhere. Thank you.

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1 HEARING OFFICER: Are there any questions
2 from the panel?

3 MR. VERVAERT: I have a question. I am
4 going to paraphrase it somewhat but I believe you testified
5 or stated that EPA does not correspond with the union's
6 position on plant emissions or something like that. I
7 guess my question is does the union give out emission
8 estimates in inplant regulations and what is the basis for
9 that statement?

10 MR. WRIGHT: The way we developed the
11 tripartite agreement, we spent a fair amount of time in
12 each of ASARCO's plants where arsenic is a hazard and
13 what we did is we spent time visually observing different
14 controls and in some cases we saw visual emissions where
15 we did not have a background document on that. We also
16 looked very closely at the worker sampling data, which I
17 think had EPA gotten to it probably would have helped
18 because there are some places where the EPA sample
19 showed very little fugitive emissions where the worker
20 indicates high levels of arsenic. Now, that indicates
21 to us that there is more fugitive emission, so that was
22 the cause of this discrepancy. We did not do a complex
23 mathematical estimate like you did. What we did is we
24 spent a lot of time looking into the controls, we tried
25 to observe the control through the entire cycle for

1 example and we looked at operations like maintenance,
2 routine maintenance, things that might occur once a week
3 instead of every day, where you might have more fugitive
4 emissions. I think our main criticism of EPA's
5 estimates were we thought you were too low on some of
6 the fugitive emissions for some of the sources. I think
7 some of that, it appears a lot of that, has been corrected
8 in the more recent documents but I haven't gone through
9 that.

10 MS. SMITH: Does that mean that you are not
11 planning on submitting your analysis of what your
12 observations were as part of the record versus our
13 analysis and then make judgments from that rather than
14 presenting some sort of formal information on what your
15 analysis has been?

16 MR. WRIGHT: We are going to submit a
17 much more formal, detailed statement at the close of the
18 record. We didn't produce a hard copy, formal, written
19 analysis of all the sources for the tripartite agreement.
20 Mostly what we tried to do was look at each job and tried
21 to think of all the physical controls which could cut
22 exposure for that particular job to the workperson in that
23 job.

24 MS. SMITH: Have you submitted both the
25 agreements you mentioned which speaks to the hooding and

1 also the agreement which talks about the flash smelting
2 furnace? Are those agreements part of the record.

3 MR. WRIGHT: Those are part of the tripart-
4 ite agreement. I think they are part of the record because
5 they are referred to in the special Federal Register.

6 MS. SMITH: And you also mentioned a health
7 analysis that you put together on the closure and that
8 will be part of your analysis?

9 MR. WRIGHT: We will submit that. The
10 figures that we have, we will submit.

11 MS. SMITH: Thank you.

12 MR. BARNES: How do the worker exposure con-
13 trols that you've observed in the Tacoma smelter compare
14 with that you've seen in other smelter facilities that
15 you visited?

16 MR. WRIGHT: Tacoma I think is one of the
17 best controled, maybe the best controled smelter I've ever
18 seen in terms of worker exposure. Now by best control,
19 the exposures are considerably higher in Tacoma in
20 the arsenic in the smelter but that's because of arsenic
21 content of the concentrates but ASARCO has certainly
22 done as much in control technology as any other ASARCO
23 facility has done and certainly more than any other
24 company. They had to do more because the exposure is so
25 much higher.

1 MS. SMITH: Is that comparison also true
2 to the Swedish plant that you visited?

3 MR. WRIGHT: I'll have to confess, when
4 I was in the Swedish facility, mostly what I was looking
5 at was controls for lead because we were involved in an
6 extensive fight over the OSHA's lead standard and that
7 smelter was lead and copper smelter, so I did not spend
8 a lot of time in the arsenic plant. The arsenic plant
9 uses a whole different technology and that technology is
10 intrinsically much cleaner, at least parts of it are.
11 It begins with a fluid roaster which may be a bit cleaner
12 but there are still problems there as well. But the
13 production of the arsenic products themselves is much
14 cleaner and that is not true due to add-on controls
15 like hooding and the work practices, it is the inherent
16 nature of the process itself. Now that kind of thing
17 ultimately could be used for fugitive emissions for the
18 arsenic plant in Tacoma. It will take a lot of research
19 but I think we can solve that problem.

20 MR. BARNES: Did I correctly ascertain
21 that you believe in fact this plant produces arsenic as
22 well as copper and that is the main reason that justifies
23 allowing it to continue to exist and use the higher
24 arsenic ore as opposed to the risks proposed on some
25 of the other plants that use the low arsenic ores.

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1 MR. WRIGHT: I'm not sure I understand
2 the question. Are you asking an economic question, if
3 the smelter would close if they were forced to process
4 lower arsenic ores?

5 MR. BARNES: I guess I was trying to
6 ascertain the weight you place on the fact that arsenic
7 is a by-product of the production process here even
8 though it's apparently associated with that higher risk,
9 both within the plant and outside the plant, because of
10 the high content of the ore used?

11 MR. WRIGHT: Well, everything we've seen
12 of ASARCO's economics, and believe me, we take a detailed
13 look at that every time we negotiate a contract, everything
14 we've seen leads us to believe that it's the company's
15 ability to process high arsenic concentrates in Tacoma
16 that keeps the plant open. The risk we were looking at
17 in terms of why we think closing the smelter should not
18 be an option considered by EPA, which should be an option
19 EPA rejects, is that basically--based in part on the fact
20 that this is our only domestic source of arsenic.

21 I heard some folks on Vashon Island say last
22 night that essentially we could get arsenic through imports
23 and that's certainly correct but I am saying that copper
24 smelting--not copper smelting but other kinds of industries
25 in third world countries and part of what worries me from

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1 a moral point of view, I realize EPA is doing business
2 in considering this, but what worries me, I know what will
3 happen in those countries if this concentrate goes there.
4 The risks in Tacoma, if it exists at all, are low. If
5 they are unacceptable, they can be lowered still further
6 without creating greater risks, but if all of this high
7 concentrate goes to a country with little or no pollution
8 control, we won't be talking about low hypothetical risks,
9 we would be talking about high actual risks and I guess
10 that worries me as a human being.

11 In the union we would like to get into the game
12 of comparing health risks with economic benefits. I don't
13 think you can trade lives for dollars but you can certainly
14 compare health risks with health risks and we have done
15 that to some extent in terms of the health risks from
16 unemployment, which I think are real. And I think again
17 as human beings we ought to look at whether as Americans
18 we can avoid or we should so easily avoid a small health
19 risk, small potential health risks by giving this problem
20 to somebody else. I don't think that is a very good way
21 for Americans to act. Let me add one thing, especially
22 if the risk can be avoided in this country through the
23 application of control techniques, that's the way we look
24 at it.

25 HEARING OFFICER: Thank you, Mr. Wright.

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1 Mr. (b) (6) ?

2 (b) (6) : My name is (b) (6) . I
3 have no statistics. I represent myself. I have lived
4 at (b) (6) for 36 years and I have never
5 honestly felt that I suffered any ill effects from the
6 smelter. I've had a garden every year. I eat vegetables.
7 I go right out in the yard and eat tomatoes and I never
8 even wash them. If anybody should be under the risk of
9 cancer, I feel the EPA should be within a block of where
10 I live. I have five neighbors who have lived in the area
11 for over 60 and 70 years. I haven't heard of them having
12 any ill effects.

13 I don't come to you with any statistics except
14 myself, that I live there and I like it there. I have
15 no connection with the smelter. I've never worked there.
16 I think it's a good company. They've treated people well
17 around there and I'd like to see them stay and I'd like
18 to see EPA give consideration to these people that work
19 there. I myself never intend to move. I will live there
20 until I die and when I go, I hope nobody blames it on
21 the smelter.

22 Thank you very much.

23 (Applause.)

24 HEARING OFFICER: Thank you, (b) (6) .

25 Ted Dzielak?

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1 MR. DZIELAK: My name is Ted Dzielak. I
2 speak on behalf of Greenpeace's 30,000 supporters in the
3 Pacific Northwest region. First of all I would like to
4 say that I agree with the comments of Mr. Wright and
5 Mr. O'Donahue that it is not so much job versus health
6 as a trade off; we can have jobs and health also. My
7 testimony will not deal as much with the technical issues
8 as it will with the political and philosophic issues.
9 I think there has been plenty of information as far as
10 the technical aspect.

11 We live in a time that tries our souls. The
12 threat of war and ecological devastation appear more
13 imminent daily. It is absolutely necessary for all of
14 us to take responsibility to transform our world and our-
15 selves if we are to survive and thrive. Yet, sadly, today
16 we live in a society where evading responsibility is
17 commonplace, accepted, even encouraged. We blame others,
18 we remain silent or we deny a problem exists. Meanwhile
19 the poisoning of our selves, our children and our
20 environment continues.

21 Some of the actors in the history surrounding
22 these hearings have also denied their responsibility to
23 others, to our society, our earth. ASARCO officials have
24 consistently worked very hard to deny any responsibility
25 for the actions, a polluted environment, of ASARCO.

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1 One can reach no other conclusion except that their primary
2 responsibility is to the shareholders of the company,
3 the responsibility to increase profits, to not have the
4 price of their products include the cost of environmental
5 protection controls. For many decades ASARCO officials
6 have received handsome salaries and the shareholders have
7 recieved dividends from profits derived from the products
8 produced by the hard work of the workers at the plant.
9 Throughout this time the smelter has spewed tens of
10 thousands of tons of poisons onto these workers, their
11 families and throughout the Puget Sound area. These
12 poisons fill our land, air and water over a wide area.
13 Arsenic is not the only deadly substance emitted from the
14 smelter. Lead, cadmium, copper and sulphur dioxide all
15 end up in our bodies and our environment.

16 Whether it is air emission standards for sulphur
17 dioxide, workplace standards for arsenic or, as presently,
18 air emission standards for arsenic, ASARCO officials have
19 seldom varied in their concerted resistance to have
20 effective pollution control standards placed on the
21 smelter's operations. They have denied that any problem
22 exists or that they are the cause of the problem. They
23 have delayed implementation of controls by saying that more
24 studies are needed or by tying up proceedings in lengthy
25 legal actions. n the end we see that ASARCO will even

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1 deny any responsibility to the welfare of its workers,
2 using job blackmail by threatening to close shop and leave
3 rather than make a commitment to provide jobs and a
4 health environment.

5 ASARCO is a large corporation with large capital
6 assets. Its parent corporations are some of the richest
7 in the world. Yet we hear that an effective environmental
8 protection standard may be too costly, in the untested
9 opinion of ASARCO officials, for ASARCO to implement.
10 Neither the EPA nor the workers or public has any way of
11 challenging the accuracy of ASARCO's figures and estimates.
12 Likewise we do not have the power to stop ASARCO from
13 closing operations if it so chooses.

14 When will we stop allowing corporations to
15 drive a wedge between jobs and health? When will we
16 demand that corporations pay for the environmental damage
17 they inflict rather than have society continue to pay
18 with its health, the health of future generations and
19 the costs of environmental degradation?

20 Responsibility is also denied by some in the
21 EPA, especially at the national level. Under the Clean
22 Air Act, the EPA must publish standards for hazardous
23 air pollutants to provide an ample margin of safety to
24 protect the public health. The proposed arsenic standard
25 does not accomplish this congressional mandate. The EPA

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1 has stated that it has ruled out the possibility of
2 eliminating arsenic emissions because that would potentially
3 close down the smelter. In effect the EPA is using a
4 cost-benefit analysis in determining how much health pro-
5 tection the public is to receive. It is illegal for the
6 EPA to attempt to use the cost-benefit equation. Congress
7 has on several occasions turned back any efforts to have
8 the EPA consider economic and technological feasibility of
9 compliance when setting air emission standards. Ironically
10 some of the efforts to introduce cost-benefit analysis have
11 been by the EPA itself.

12 Congress has refused to consider economic cost
13 when it comes to protecting our health and environment for
14 good reason; if allowed, cost-benefit would give industry
15 a strong weapon in their fight against health standards.
16 The calculation of the costs of an environmental regula-
17 tion is relatively easy. Quantifying the benefits of a
18 regulation presents more difficult ethical and methodolog-
19 ical problems. How do you put a dollar value on a life?
20 How much is it worth to you to know that your child will
21 grow up healthy? What is the purchase price of a clean
22 environment or a smoke-free sky or disease-free fish?
23 These and other benefits of environmental regulations
24 are impossible to measure in terms of dollars. The EPA
25 does not even attempt to do so. Its only estimates are

1 of the costs to ASARCO for implementing the proposed
2 standard.

3 The true extent of the dangers of arsenic exposure
4 are not fully known and may never be known with certainty.
5 We do now know that it causes cancer, perhaps birth
6 defects, high blood pressure, angina and other problems.
7 Should we risk devastating health and environmental
8 effects until we have unquestionable proof of the dangers
9 we face from arsenic? Greenpeace believes that the EPA
10 should adopt a standard which protects our health to the
11 greatest degree possible. Many citizens and groups feel
12 the same way. Our position is consistent with the
13 Congressional intent of the Clean Air Act. In the
14 Senate Report on Amendments to the Clean Air Act, the
15 Senate stated: "Margins of safety are essential to any
16 health-related environmental standards if a reasonable
17 degree of protection is to be provided against hazards
18 which research has not yet identified."

19 Because many scientific groups and the EPA agree
20 that arsenic is a no-threshold carcinogen, we call on the
21 EPA to obey its legal mandate under the Clean Air Act and
22 set a standard that provides an ample margin of safety to
23 the public. The standard should have near-zero emission
24 levels as its goal. The standard must not be based on
25 economic cost.

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1 Specifically we recommend that the EPA adopt
2 the excellent recommendations by the Tacomans for a
3 Healthy Environment. We offer brief comments on each of
4 their recommendations as well as our own recommendations.

5 First, Emission Reduction Requirements,
6 we support the requirement for secondary hooding as pro-
7 posed by EPA and PSAPCA. In addition we call for a
8 specific time frame to reduce emissions further from all
9 sources, including stack emissions and refining operations.

10 Second, Ambient Air Level Requirements, an
11 ambient air standard will reduce public exposure to
12 arsenic, the primary goal of the Clean Air Act.
13 The eventual goal should be arsenic levels not to exceed
14 natural levels. Steep monetary fines must be imposed and
15 collected for violations. Criminal charges must be pressed
16 if there is intentional violation of the standard.

17 Thirdly, Health Screening Program, a health
18 screening program is essential. It should include ongoing
19 urinalysis and long-term longitudinal health tracking.
20 An independent study of arsenic effects on wildlife and
21 the environmental quality should also be implemented.

22 Fourth, Insurance or Bonding for Future Damage
23 Claims. Several corporations are attempting to escape
24 liability for the health effects they have inflicted on
25 workers and residents by filing for bankruptcy. We must

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1 not allow that to happen here. ASARCO should pay the cost
2 of the damage it causes to human health.

3 Fifth, Worker Displacement Funds. If ASARCO
4 attempts to follow through on its threat to close its
5 operations, the EPA should press ASARCO to meet with the
6 EPA, the union, community groups and local, state and
7 federal officials for the purpose of establishing a
8 Workers Displacement Fund to assist workers who are to be
9 displaced by the closure.

10 In conclusion, the danger of the continuing
11 production of toxic substances must be faced. If not,
12 we, and our environment, will suffer devastating consequences.
13 Greenpeace believes that the best way to deal with this
14 growing problem is to start now and reduce the amount of
15 toxic substances we produce. Becoming a toxic-free
16 society will involve hard choices. It will call on all
17 of us to take on the responsibility of transforming our-
18 selves and our society. We urge the EPA to take on its
19 responsibility to protect our health and our environment.
20 Thank you. Are there any questions?

21 (No response.)

22 HEARING OFFICER: Thank you, (b)
(6)

23 (b) (6) ?

24 (b) (6) : Good morning, ladies and
25 gentlemen. I am (b) (6) . I have no personal

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1 axe to grind with the Tacoma smelter as I have no
2 relations of any kind monetary with them, simply as a
3 live-long resident of Tacoma and a concerned citizen.
4 I wish to offer my present physical condition as a testimony
5 in regards to the Tacoma smelter. I was born within a
6 two-and-one-half mile radius of the Tacoma smelter. My
7 family raised most of our food. My mother canned our
8 fruits and vegetables which were raised in our garden
9 and my father raised rabbits, chickens and sometimes ducks
10 which provided most of our meat and eggs. All this was
11 before the EPA was even heard of.

12 Later, when I married, we lived even closer
13 to the Tacoma smelter and I have two healthy children and
14 two healthy grandchildren. As for myself, I am in very
15 good health and I intend to live the rest of my life
16 that way. I am 63 years of age and still live within the
17 two-and-one-half mile radius of the Tacoma smelter. There
18 are others like me that I could name who have lived their
19 lives just as long or nearly as long as mine within that
20 two-and-a-half mile radius and we're all free from lung
21 cancer.

22 As to how much arsenic is harmful to a human
23 being, if it is harmful, I must be a walking powder keg
24 for I still live within that two-and-a-half mile radius.
25 Others may assume conditions relating to health but I am

1 living proof of good health, born within that two-and-a-
2 half mile radius and still living within that two-and-a-
3 half mile radius. o I look ill? No way. I am a very
4 healthy person. Thank you.

5 Are there any questions you would like to ask
6 me?

7 (No response.)

8 HEARING OFFICER: Thank you, (b) (6) .

9 (b) (6) : Thank you for your time.

10 HEARING OFFICER: (b) (6) ?

11 (b) (6) : My name is (b) (6) and in
12 a couple of months I'll be 77 years old. I worked for
13 24½ years for the Tacoma smelter. I carried arsenic for
14 18 solid years, 600 to 700 pounds every day. There's
15 nothing wrong with me. I do know that arsenic is not a
16 healthy element to breathe, any more than the fumes out of
17 an automobile or furnaces on our homes but the whole
18 trouble is Tacoma becomes the first city in the United States
19 to be on trial for the rest of the big industries in the
20 United States. Keep that in mind because I am not here
21 to fool around or say any jokes.

22 Those big stacks which you see all over the
23 country, all of those high stacks represent the strength,
24 the industry of our country, the trains, the automobiles
25 and everything we have. Now if we're going to stop them

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1 here and shut down the smelter just because a few people
2 complained, and it is only a few people, less than one
3 percent, if they're going to shut it down, then what
4 will be the next industry, St. Regis Pulp Mill?

5 I hear such rumors every day or how about
6 Kaiser's Aluminum Plant or Hooker's Chemical. Tacoma
7 will become the first city and it will spread like wild-
8 fire. If those few people win exactly what they're
9 after, one big industry after another will collapse.
10 It's a disease which spreads in our country.

11 I am not saying that arsenic is something
12 nice to smell. Arsenic is very like powder, like fine
13 flour, but still there is a limit. We've got to have
14 arsenic in our bodies and the United States needs that
15 arsenic. It is very vital to our country and to the
16 medicines which we take, there is arsenic in some of it.
17 The smelter is the only one, I believe, in the United
18 States that produces that arsenic. If you eliminate that,
19 you eliminate a lot of things which our country depends
20 on.

21 The trouble with people, they complain about
22 lung cancer but they abuse their lives. They've forgotten
23 how to eat. They forgot how to drink without abusing it.
24 They live on drugs, over the counter, millions of dollars
25 every month. People that work in an office, they get in

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1 depressions, they open up their drawers and they've got
2 tranquilizers, otherwise they won't be able to work, they
3 won't be able to sleep, they won't be able to eat unless
4 they've got pills. What do you expect of the human body?
5 What should it become? Sure it's getting weak. We're
6 born with gas or cancer. Thirty years from now you will
7 remember my words. The sun is just coming out where we
8 can expect the child is born with cancer but the main thing
9 is cancer finds a weak spot in the human body and that's
10 where it lays its eggs. It travels in your blood.

11 So what is the reason now that the people want
12 to eliminate not only the Tacoma smelters but they also
13 put on trial 600 families which make their living, the
14 American dream as they call it, where they want to
15 build their homes, they want to send their kids to
16 colleges, with what? Being on Welfare? Before the end
17 of the century I predict half of the working population of
18 the United States will be on Welfare. Half of the working
19 force will be on Welfare by the end of this century
20 because our country is deteriorating from within just as
21 we deteriorate our own bodies from within with drugs.
22 Remember that. So don't try by all means to throw 600
23 people, not only them, other ones that bring the ores
24 in from different states and there's more; there's over
25 a thousand families, we might as well put it that way.

1 There's no sense to throw them out of jobs. It's bad
2 enough as it is now. They are doing the best they can
3 to eliminate all the arsenic that goes out of the stack.

4 I remember a few years back a young man, a
5 lawyer from Vashon Island, he made a statement. He
6 said when he was a kid he could hardly see a car or truck
7 on the island but now he says there's more than two and
8 three cars in each garage and it's awful down there. He
9 says you can't even breathe, he says, on account of
10 the smelter, and the smelter wasn't producing any more
11 arsenic in those days than it does today. They've got
12 it 40 percent down. So what is the cause? The automobiles.
13 You people are educated. You know doggone well that
14 about 70 percent of the pollution is from the automobiles,
15 it's not just the smelter. I'm in the doggone best of
16 health and I've been carrying it.

17 Are there any questions?

18 (No response.)

19 HEARING OFFICER: Thank you very much.

20 The next few witnesses are Dr. Deborah Barto,

21 (b) (6) and (b) (6).

22 Dr. Barto please.

23 I would like to thank those people as they are
24 leaving. I hope they have learned something about
25 civics and political science.

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1 DR. BARTO: My name is Deborah Barto
2 and I am from Kirkland, Washington. I would like to
3 begin by describing my qualifications and experience.
4 I have been Director of Medical Oncology for cancer care
5 at Evergreen General Hospital in Kirkland, Washington for
6 four years. I have also been head of the Tumor Board for
7 four years and of the Cancer Committee for four years.
8 I have been an Assistant Clinical Professor of Medicine
9 at the University of Washington for four years. I have
10 been Chief of the Department of Medicine at Evergreen
11 Hospital for the last year.
12 I work in a nearby community and must live
13 with the effects of the decision. I am a practical cancer
14 specialist actually taking care of patients.
15 My testimony is that arsenic is harmful to the
16 health of those exposed to emissions in the environment
17 by increasing their risk of cancer. It is more cost
18 effective and humanitarian to prevent cancer than to
19 pay for the cure or palliation of its ravages.
20 Every single one of my cancer patients whom I
21 told I was coming down here to testify supported my stand
22 against arsenic emissions. You would probably be amazed,
23 as I was, to learn that even people who are dying of
24 cancer can have the desire to reach out and help others.
25 One's perspective on this issue changes once one develops

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1 cancer or has to treat it. One becomes more motivated
2 to prevent cancer and one way is to clean up the environ-
3 ment. Of course, I stand against all carcinogens and
4 arsenic is only one of many we are exposed to.

5 Arsenic causes cancer of the lung, skin and angio-
6 sarcoma of the liver. Please remember, these are less-
7 curable cancers, associated with suffering.

8 In my opinion, there is no threshold below
9 which arsenic does not induce cancer. In 1980, the
10 9th Circuit Court of Appeals ordered SOHA to assess
11 the degree of risk from occupational exposure to arsenic.
12 After reviewing all the evidence, OSHA concluded that a
13 10 $\mu\text{g}/\text{m}^3$ arsenic standard was needed to substantially
14 reduce a significant risk of lung cancer. More importantly
15 using input from many respected scientists, OSHA decided
16 that there was no threshold below which exposure to
17 arsenic is safe. I fear that people living around the
18 smelter may exceed the 10 $\mu\text{g}/\text{m}^3$ standard above which
19 OSHA did not feel workers should be exposed. People who
20 live near the smelter are exposed for many more hours than
21 a worker would be.

22 It may be difficult to decide on a safe exposure
23 level to arsenic. However, we should err on the side of
24 caution and adopt as stringent a standard as possible.
25 If technologies exist to decrease arsenic output from

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1 the smelter, they should be applied. Other smelters
2 have done so. This is a matter of conscience. The
3 cancers induced by environmental causes will not be
4 diagnosed for ten to thirty years. This is also a matter
5 of economics. It is almost always more cost effective
6 to reduce the cause of illness rather than spend so much
7 to cure or palliate it. We will mortgage the next
8 generation to pay for a lack of controls now. We will
9 pay, one way or another. I don't think ASARCO will
10 volunteer to pay for the cancer bills of those in their
11 community. The payment will come out of tax dollars.
12 Prevention is cheaper.

13 The speaker who follows me, Mr. John Roberts,
14 will describe some work we did together which will be
15 presented at the Pacific Northwest International Section
16 of the Air Pollution Control Association here in Seattle
17 on November 17th. We studied arsenic in dust around
18 the Tacoma Smelter and concluded that children with pica,
19 or who eat dirt and other materials they shouldn't, may
20 have a significant arsenic intake. For example, some
21 children who live near the smelter have three times the
22 normal amount of arsenic in their urine. Also, some hair
23 samples contained 20 times the usual amount of arsenic.
24 Hair analysis can give a doctor an idea of the long-term
25 ingestion or arsenic. I believe that some form of

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1 continuous monitoring of children who live near the
2 smelter should be done.

3 Finally, as a cancer specialist, Chief of
4 Medicine, and also as (b) (6) I recommend a reduction
5 in the arsenic level produced by the Tacoma Smelter to the
6 lowest achievable levels. Children in a one mile radius
7 from the smelter should be monitored with hair and/or
8 urine analyses for arsenic.

9 HEARING OFFICER: Are there any questions?

10 MS. SMITH: The studies you have mentioned,
11 will those be posted so we can enter them into our
12 record?

13 DR. BARTO No, it hasn't been published
14 yet.

15 MS. SMITH: I would appreciate it if they
16 could be entered into the record. I was also curious,
17 I'm not necessarily certain how arsenic enters the body.
18 Have you found additional medical articles that, perhaps
19 in your research, that should be submitted into the record?
20 Have you reviewed the medical evidence that produced
21 part of this document, anything you may have found?
22 I guess I am asking for that to be submitted as well.

23 DR. BARTO We will submit what we have.
24 I have written about 15 articles myself on this subject.
25 It is hard to be very secure about what you can say

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1 in regards to arsenic but I am sure it causes cancer
2 and I believe there is no threshold. That is my conclusion
3 from reading about 15 studies.

4 MS. SMITH: Thank you.

5 HEARING OFFICER: John Roberts?

6 MR. ROBERTS: My name is John Roberts
7 and I am a professional engineer and I would like to tell
8 the honorable members of the panel that this open and
9 often adversarial process is a wonderful way to educate
10 the public about the issues and about the difficulties
11 of findings wisdom in government at this time. I commend
12 you and EPA for doing this.

13 I am a principal in Engineering Plus,
14 specializing in air pollution control and boiler efficiency.
15 I have a masters degree in air pollution from the University
16 of Washington. I formerly worked as a source test engineer
17 for PSAPCA and served as project coordinator for a number
18 of studies on the impact of the Tacoma Smelter and
19 fugitive emissions. I propose that we establish a goal
20 of getting Ruston's children's urinary arsenic levels
21 down to normal by 1988.

22 The EPA standard of arsenic exposure is a
23 most important step in accomplishing this goal. However,
24 it will not suffice. The help of local health authorities
25 and families who are willing to take responsibility for the

1 ingestion of the arsenic is also needed. Both ingestion
2 and breathing are important routes of routes of the entry
3 of arsenic into children. This is discussed at more
4 length in the study that we will submit that will be given
5 at the Seattle Sheraton Hotel.

6 (Slide shown.)

7 We concluded in our study that there is much
8 that can be done now by health authorities to help
9 families who are willing to take responsibility for their
10 children's ingestion of arsenic contaminated dust, but
11 they cannot do it all. It is also essential to reduce
12 emissions. The arsenic in dust and on surfaces that
13 the children touch comes from emissions.

14 This graph is taken from our paper and shows the
15 annual average arsenic for three ASARCO stations near
16 the plant. It shows the children's spot urinary arsenic
17 and the annual average for urinary arsenic for Tacoma
18 smelter workers. There is no trend in the ambient arsenic
19 data and only a slight suggestion of a downward trend in
20 children's urinary arsenic. All of the samples were taken
21 by Dr. Barteo. By contrast, there is a strong downward
22 trend in the workers' urinary arsenic concentrations.
23 Most of the drop came in 1974 and '78 when ASARCO responded
24 to OSHA and state permissible exposure levels of 10 ug/m^3
25 eight-hour workplace standard. ASARCO used worker education

1 better protection, such as improved face masks, and
2 protective clothing, clean rooms and good personal hygiene
3 and housekeeping to reduce both oral and pulmonary intake
4 of arsenic. The same things need to be done for the
5 children in the community.

6 It is proposed that the people in the community
7 be given the same protection as the workers in the plant
8 by setting operational standards for arsenic that are
9 somewhat equivalent to the higher number of hours of
10 exposure of susceptible people.

11 (Slide shown.)

12 People are exposed for 168 hours per week and
13 can be compared with 40 hours for the employees. The
14 young, the old and the ill in the community as well as
15 pregnant mothers need adequate protection. Study of past
16 air-monitoring data indicates that the OSHA eight-hour
17 standard is exceeded for 24 hours in the community around
18 three or four times each year. One ug/m^3 is exceeded
19 around 40 percent of the time. In March and April
20 ASARCO reported ambient concentrations above $3.4 \text{ ug}/\text{m}^3$
21 in the ambient air, mostly caused by strong winds that
22 re-entrain dust from surfaces in the plant and only
23 occasionally by dust pulling or low level inversions.

24 ASARCO would have a number of options in finding
25 a least cost way to meet an operational standard at the

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1 plant boundary as follows:

2 One, wash or wet down roofs and surfaces in the
3 plant where arsenic collects. This does not cost very much.
4 And, two, finish installing the converter secondary hoods.
5 Three, enclose and ventilate the arsenic building.
6 Four, do a chemical mass balance study to find out which
7 of the remaining sources in the plant contribute and to
8 what percentage, to the arsenic in the ambient air.
9 The chemical fingerprints of the sources would be matched
10 with the combination of elements found in the community
11 air. And, five, curtailment of operations under unfavor-
12 able conditions. Six, change the process for making
13 arsenic. Seven, relocate the arsenic building, which is
14 now close to the plant boundary. Eight, expand the plant
15 boundry, and nine, assemble the presently available
16 equipment to measure arsenic in the air every half hour
17 on a real time basis to increase the cost effectiveness of
18 curtailment.

19 Dr. Eric Crecelius of Battle Northwest,
20 who has ten years of experience in measuring arsenic
21 stated in 1976 that it is possible to build such an
22 instrument. A common tape sampler has been coupled with
23 an x-ray fluorescent instrument to give immediate metal
24 analysis. The tape sampler collects metal on a spot from
25 air passing through a paper tape for 28 minutes. This

1 spot is advanced to the x-ray fluorescent instrument for
2 analysis. The information is then telemetered to a central
3 control station. The Nuclear Data Corporation estimated
4 the cost could be \$30,000 in 1976. No one wanted to pay
5 the money at that time.

6 Recommendations: it is recommended that an
7 operational 24-hour standard of 1 ug/m^3 be established
8 for the plant boundary and be phased in over a four-year
9 period to give ASARCO time to work out a control program.
10 The number of exceedances would decrease each year as
11 follows:

12 (Slide shown.)

13 1984 - 100, '85 - 75, '86 - 50, '87 - 25,
14 '88 - 0. This would give time to install the new furnace
15 for SO_2 control.

16 ASARCO needs to be given the same motivation to
17 protect the arsenic exposure in the community that they
18 now have to protect the exposure of the workers. It is
19 estimated that such a standard as EPA might set would
20 reduce the exposure in the community by 50 percent, if it
21 were 1 ug/m^3 , most Ruston families who are willing to take
22 responsibility for their children's oral intake, might
23 achieve a background level of 15 ug of arsenic per liter
24 of urine in four years if ASARCO meets the 1 ug/m^3
25 operational standard and the health authorities provide

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1 education and monitoring to help reduce oral intake of
2 existing and dangerous emissions that have contaminated
3 the dust.

4 Achieving background levels of arsenic in
5 Ruston children by 1988 is a realistic goal. It will
6 require the commitment of ASARCO and the families in the
7 community if we are to have both health and jobs.

8 Thank you for the opportunity to testify at
9 this hearing.

10 HEARING OFFICER: Mr. Roberts, do you have
11 a copy of your slide as part of your submittal?

12 MR. ROBERTS: Yes.

13 HEARING OFFICER: Are there any questions
14 of Mr. Roberts?

15 MR. BARNES: Do you have any explanation
16 for the apparent inconsistency between what has happened
17 to urinary arsenic levels of workers compared to children
18 and why with some of these controls going on in the plant,
19 controls dealing with fugitives, would some of that show
20 up in reduced ambient levels and reduced lead levels in
21 people outside the plant?

22 MR. ROBERTS: The taking of spot urinary
23 arsenic for the children is very difficult to compare with
24 the workers' urinary arsenic, where you have 560 workers
25 who take an average every month, so the average that you

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1 see there on the form is for 6,000 workers yearly arsenic
2 so that has a good deal more statistical stability. The
3 taking of spot urines for say 20 children, the urines
4 can go up and down a great deal so I believe that there
5 has been a slight reduction but I think that the main
6 advantage that the workers have had is the better house-
7 keeping, the better personal hygiene so that they have
8 really reduced the amount of ingestion of arsenic and I
9 think that for the smallest children, by that same route
10 of control, that would work very well too but again I
11 would like to qualify that. The amount of arsenic that
12 will be made in the dust after the standard is met, we
13 will still need to take extra precautions to live in the
14 Ruston community if you want to have the same urinary
15 arsenic as everyone else.

16 MS. SMITH: I notice that you gave
17 representation for a 24-hour standard number. Did you also
18 have one for an annual average as the Department of
19 Ecology did?

20 MR. ROBERTS: No, I did not.

21 MS. SMITH: Did you have any specific
22 reason for that?

23 MR. ROBERTS: Frankly, I haven't given it
24 an analysis.

25 MS. SMITH: Thank you.

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1 HEARING OFFICER: Mr. Roberts, you said
2 your study is going to be presented in Seattle. Can you
3 tell us when it is going to be discussed or has it been
4 discussed.

5 MR. ROBERTS: This study will be presented
6 at 4:30 at the Sheraton Seattle Hotel on November 17th
7 at the Air Pollution Control Association Conference.

8 HEARING OFFICER: Thank you.
9 Any further questions?

10 (No response.)

11 (Abstract of presentation copied into the record)
12 MONITORING AND REDUCING TOXIC INTAKE OF CHILDREN NEAR THE
13 TACOMA SMELTER AND IN SOUTH PARK, SEATTLE;
14 By: John W. Roberts and Deborah Barto, M.D.

15 John Roberts is the president of Engineering Plus,
16 specializing in air pollution and boiler efficiency at
17 1425 E. Prospect No. 3, Seattle, Washington 98112. He
18 formerly worked for the Puget Sound Air Pollution Control
19 Agency. Deborah Barto, M.D., is Chief of Medicine and
20 Oncology at the Evergreen General Hospital in Kirland,
21 Washington. She is medical advisor and board member of the
22 Community Hospice. She has an internal medicine practice
23 with a specialty in oncology.

24 The potential intake and health effects for small
25 children living in South Park (S.P.) and near the Tacoma
Smelter (SML) were estimated. Data on emissions as well as

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1 concentrations of arsenic (As), cadmium (Cd), lead (Pb)
2 and benzo-d-pyrene (BaP) in air, road dust, house dust,
3 soil, leafy vegetables, urine, hair and blood were reviewed
4 The 4 to 30 percent of children with dust or soil pica
5 eat one to ten grams of dust and may exceed allowable
6 daily intake for Cd, Pb and BaP near the smelter and in
7 South Park.

8 Ingestion of dust was calculated to be the major
9 route of entry for toxics for small children. Diet is a
10 large source for Cd and BaP. Good personal hygiene and house-
11 keeping control of road dust, dietary strategies, biological
12 monitoring and relocation may be necessary to reduce toxics
13 in the body by 50 percent. These methods have been used
14 by SML and the lead industry to protect workers. Such
15 action is needed to multiply the value of industrial
16 emission controls and lower the cost of achieving health
17 standards. Family action encouraged by public education
18 guided by doctors and evaluated by biological monitoring
19 is essential to reduce ingestion of toxicants. These
20 methods may be an affordable way to mitigate the impact of
21 present emissions.

22 Annual Meeting of Pacific Northwest International
23 Section of Air Pollution Control Association, Seattle,
24 November 16 through 18, 1983. Presentation time: 4:30 p.m.
25 Thursday, November 17, Seattle Sheraton.

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HEARING OFFICER: Thank you, Mr. Roberts.

Linda Tanz?

(b) (6) : I am (b) (6) for the Tacoma-Pierce County League of Women Voters, testifying for the League of Women Voters of Washington, which is a statewide membership organization.

The League of Women Voters has been working for air pollution controls on industrial production since the Spring of 1971. Under our Air Quality position, we support regulation of stationary sources by controls and penalties, including inspection and monitoring, full disclosure of pollution data and substantial fines.

The Washington State League of Women Voters has a long and active history of involvement in regulatory efforts to reduce emissions of sulfur dioxide and heavy metals from the ASARCO Tacoma Copper Smelter. Presently we are concerned with health risks and safety judgments as they relate to the regulation of arsenic, a hazardous air pollutant and known carcinogen.

An appreciation of the distinction between risk and safety is essential to the understanding of environmental standard setting. Risk is probably that something undesirable will happen. Risk measurement draws upon scientific understanding of the relationship between exposure and effect, and although it cannot predict scientific events,

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1 makes statistical projections about the frequency with
2 which an event will occur in the future.

3 Safety, on the other hand, is a policy issue that
4 involves the weighing of properly identified risks and
5 benefits. Safety decisions must involve the public to
6 reflect the level of risk citizens are willing to accept.
7 A margin of safety must be incorporated in the permissible
8 dose to compensate for the degree of uncertainty in
9 determining that dose. The less precise the determination
10 of hazard, the larger must be the margin of safety.

11 In the case of considering control of arsenic
12 emissions from high-arsenic primary copper smelters, the
13 EPA will be looking at what might be considered a unique
14 risk-management situation. We are talking about controls
15 that will apply to only one industry, and in fact, one
16 installation. However, the scientific data necessary to
17 make a safety judgment is not complete. The data in the
18 draft Environmental Impact Statement does not take the
19 following important factors into consideration:
20 one, accurate ambient air concentrations of arsenic,
21 two, possibility of arsenic-related health problems other
22 than lung cancer, such as birth defects, three, workplace
23 exposure to arsenic, four, recognition of the most
24 susceptible population and five, the public's exposure to
25 other emitted substances, such as SO₂.

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1 These are all important considerations and
2 ideally, we should have the scientific data to address
3 them. In this case, where the EPA is under a court order
4 to proceed in a determination before all the facts are in,
5 the League of Women Voters would remind you that the charge
6 of the EPA is to protect the public health and the environ-
7 ment. Therefore, as the EPA makes its judgment, it must
8 provide a sufficient margin of safety.

9 To provide that margin, the League supports not
10 not only the best available technology, suggested as being
11 secondary hooding, but also recommends the following
12 provisions: First, an enforcement action level accompanied
13 by continuous monitoring on the stack as well as in the
14 community, with violations resulting in either a curtail-
15 ment of operations or a substantial fine.

16 Second, health screening of the affected
17 community population which will increase the data base and
18 will quantify other health problems in addition to cancer
19 fatalities.

20 Third, a plan developed and implemented by
21 ASARCO to reduce fugitive arsenic emissions lessening the
22 arsenic burden to the surrounding community.

23 In making environmental decisions, we make value
24 judgments in the face of scientific facts. In this case,
25 the scientific information is incomplete. As more becomes

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1 known, we may find these provisions either too stringent
2 or not stringent enough. The community, the industry
3 and the EPA must all recognize the need for more health
4 information and the likelihood that these provisions will
5 have to be adjusted.

6 The League of Women Voters of Washington commends
7 you for holding this public hearing, as we believe that
8 citizens are rightfully part of this and future discussions.
9 The degree of risk or uncertainty that the public will
10 accept from potentially dangerous products and other
11 substances should always remain a subject of open and
12 informed discussion. The League of Women Voters will
13 continue to be involved in following both the scientific
14 findings and the public policy decisions.

15 HEARING OFFICER: Are there any questions?

16 (No response.)

17 HEARING OFFICER: What is your league,
18 the entire state of Washington or what chapter?

19 (b) (6) : Of Washington State but I am
20 from the local league.

21 HEARING OFFICER: How large a membership
22 does the League have?

23 (b) (6) : Twenty-two hundred women.

24 HEARING OFFICER: Thank you very much.

25 (b) (6) ? Is (b) (6) here please?

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(No response.)

HEARING OFFICER: (b) (6). Are you ready to make your statement? We are a little ahead of schedule. (b) (6) is not here so you will be number twelve.

(b) (6): My name is (b) (6) and I have lived in the town of Ruston for three years. My wife and I have raised numerous gardens and we have never been bothered by the smelter's emission. We have never been sick and as far as I am concerned, it is not a health problem.

HEARING OFFICER: Thank you very much. Any questions.

MS. SMITH: Are you a smelter worker as well? You don't have the daily exposure.

(b) (6): The stacks are only (b) (6) blocks away.

MS. SMITH: Thank you.

HEARING OFFICER: Is (b) (6) here yet?

(No response.)

HEARING OFFICER: Well, she is not due until 11:00. Is (b) (6) from the Friends of the Earth ready? (b) (6) is substituting for (b) (6).

(b) (6): I am (b) (6) and I've been

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1 working at the smelter. I worked there for 32 years.
2 It was 1946 when I hired on and I was most of the time
3 bumping sacks of ore and stuff of that kind, sweeping
4 out the high places, picking up dirt and dust to try to
5 keep it cleaned out under the feet a little bit while
6 you get around. Well I never did feel sick or anything
7 through all that time. I still feel good and I am 71 years
8 old and I retired when I was (b) so I've been out a little
9 over (b) years and I'm still feeling good. I'm repairing
10 my own house, doing my own work. It didn't cut me down
11 in strength or anything of that kind. All the materials
12 and stuff that you get and I started in and I worked in
13 the casting house for about 8 months or something like that
14 and then I went into the refinery and stayed there and
15 did what they called cathodes there for 2½ years and then
16 we put some papers on the sign board and I signed up for a
17 job in the steel works out there. I worked in the steel
18 for years and before that I worked on the shipyards for
19 5 years welding, so I got into the department as quick as
20 I could and I worked there as a helper for a while in
21 the regular steel department, fitting, and then I went
22 from there to the welder's shop. I started there with
23 them and I could do a pretty good job so I didn't get off
24 on the easy jobs all the time. Some of the ones are pretty
25 dirty. Some of them you can grind them off and they will

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1 look just as pretty as could be, like it was new stuff.
2 You stick a welder's torch to it and the stuff would just
3 blow like it was sand. You just take an electric torch
4 to it so I would just take and burn all that stuff out
5 that would fall out with an electric torch and turn
6 around and weld it up. Two-thirds of the time I got all
7 the dirty jobs but that didn't bother me, I was just getting
8 paid anyway. I let it go at that and it didn't hurt my
9 health a bit. Places up in the flue you could weld up
10 there and boy that green-black smoke looked terrible,
11 but if it was going to kill anybody, I'd have probably been
12 one of them but it hasn't bothered me a bit. I guess I
13 just have a good pair of lungs or whatever the problem is,
14 wherever it starts from. I am still here and I am going
15 to say this much about the place, that if I had to go back
16 to welding, I'd rather go back down there than I would
17 to some of the shipyards and places where they're going ship
18 repairs because some of that stuff, when you burn all that
19 off, is worse, all that crud and rust on them is worse
20 than down at the smelter.

21 That's all I've got to say now.

22 HEARING OFFICER: Thank you, (b) (6).

23 Any questions?

24 (No response.)

25 HEARING OFFICER: Next we have the following

1 three individuals, (b) (6) , (b) (6) and
2 (b) (6) . Is (b) (6) here yet?

3 (No response.)

4 HEARING OFFICER: Is Glenda McLucas
5 here?

6 MS. McLUCAS: I am speaking today as a
7 consulting geologist with 12 years of working experience
8 in my profession.

9 HEARING OFFICER: Will you give us your
10 name?

11 MS. McLUCAS: Yes, my name is Glenda
12 McLucas.

13 I am speaking today as a representative of the
14 geologic and mining community at large, as well as an
15 employee of industrial mineral products, Ravendale,
16 Washington, a mining company that recovers and reprocesses
17 smelter slag wastes from ASARCO and ALCOA. The Company
18 has a policy of recovering material that normally would go
19 to waste and turning it into usable product that is then
20 entered into the marketplace.

21 As a past employee of the New Jersey and Washing-
22 ton State Geologic Surveys, I developed an appreciation
23 for the need to regulate the mining industry and other
24 heavy industries as well by standards that are developed
25 from fundamental scientific and technical data.

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1 I also learned the value to the public of assuming
2 a helpful partnership attitude toward industry in the
3 solution of environmental problems as opposed to the
4 assumption of an adversarial position which always consumes
5 more time and money and encourages secrecy, mistrust and
6 mutual frustration without any accrued benefits.

7 As an active industry-based mine geologist and
8 hazardous waste disposal expert, I developed an appreciation
9 for the cost, effort and frustration involved in regulatory
10 compliance, in dealing with representatives of the media
11 who are generally not technically trained to write about
12 the highly technical subjects they discuss and who, often,
13 do not meet the minimum journalistic standards of ethics,
14 accuracy and objectivity as well as members of the public
15 who are often destructive, obstructionistic, emotionally
16 and politically unstable and also untrained technically
17 to evaluate the immense amount of research and development
18 required to establish a heavy industry and to keep it
19 operational.

20 For the outlay of a twenty cent postage stamp,
21 a member of the public can post a complaint with a
22 regulatory agency over what he perceives as an environmental
23 outrage. The public agency expends large amounts of time
24 and money to verify or dispute that complaint. More
25 often than not the industry in question also expends huge

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1 amounts of time and money to verify or disprove the claim.
2 When the flap has settled down and an unjustified claim
3 has been put to rest, the only party who has not contributed
4 to its cost is the person who licked the stamp.

5 The same can be said for the media. In the
6 interest of sensationalism, a newspaper can print damaging
7 material without checking out facts first. Industry pays
8 with a diminished reputation and a flurry of costly
9 independent laboratory analyses to disprove that claim.
10 When the facts are gathered and an accurate case is made
11 against the claim, the media has lost interest in the
12 subject and the correction piece, if any, appears in a
13 small column lost in the middle of the newspaper. As one
14 example of my personal experience with the media regarding
15 an arsenic scare, I would like to relate the following
16 events; a local environmentalist decided he was going to
17 continue his vendetta against ASARCO through industrial
18 mineral products and the slag that copper smelters make
19 that is processed adjacent to the ASARCO Plant. This slag
20 contains 1 percent arsenic which is bound up molecularly.
21 The Navy who buys it as a plastic abrasive has several
22 public agency laboratories and industrial mineral products
23 as well has performed extensive tests under high acid,
24 high temperature conditions to demonstrate the the leach-
25 ability of the slag. The leach tests have never been

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1 successful. That's a matter of public record. Nonethe-
2 less, this fellow decided he was going to follow one of
3 the slag trucks to the mine that operate in Ravensdale
4 and demonstrate that the arsenic would leach out of it
5 and inadvertently contaminate the body of water.

6 I use this slag in the mine as a traction
7 substance on slippery mine roads in the wintertime. I've
8 done it only for one year. It is an excellent traction
9 material because of its high specific gravity. There is
10 a lake adjacent to our Washington plant. It is not a
11 source of domestic water. It is 90 degrees from the direc-
12 tion of ground water flow and the surface water flow out
13 of the mine. However, there is a drainage from the under-
14 ground pool which is adjacent to the units that does run
15 towards the lake and does have elevated arsenic because
16 arsenic is always associated with coal.

17 In any event, the next thing that happened
18 was that in out settling ponds I saw a television crew.
19 I didn't know who they were and they refused to tell me
20 who they were and I could only tell that they were from
21 the University of Washington. Eventually I figured that
22 out because of the State insignia on the side of their car.
23 When asked why they didn't get permission to go on the
24 property, they said that they made the assumption that
25 because of the nature of their business there that they

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1 wouldn't be allowed on the property. I called the
2 University. I was met with rudeness. I was not given an
3 opportunity to review their product test before they
4 aired it and not given the opportunity to tell the
5 industrial mineral products' side of the story.

6 The next thing that happened was that we got
7 a call from the Kent News Journal. A fellow came out
8 and I opened our files to him as we always do. We're open
9 about providing information; we provided him with photo-
10 graphs and extended every courtesy to him that we could,
11 which was a mistake, because the next day in the paper
12 we had a very ugly article. What this fellow did was
13 get down behind a two-foot high pile of smelter slag
14 which was about 10 foot long and all that we had on the
15 property, shoot up on it to make it look like a mountain
16 with several of our trucks poised in the background.

17 This is an ugly, non-productive attitude towards
18 the industry and it must stop if basic industries are to
19 survive in this country.

20 The matter of elevated arsenic levels in the
21 water, research of the Kent Water District found that
22 the water in the Ravensdale Lake was in fact elevated
23 from the normal 14 parts per million in surrounding
24 drainages to 33. That was based on one test that was done
25 years before we ever brought in the slag to the property

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1 and that was the basis of the newspaper article.
2 Industrial Mineral Products was then put in the position
3 of sending out water samples from that lake and surrounding
4 lakes to four independent labs which cost \$4,000 only
5 to discover that two labs found absolutely no evidence
6 of arsenic, one other one found--well it was below the
7 detection level of the instruments they used on it, which
8 was less than 5 parts per million, and one found it at
9 about 7 and another at about 10. So the damage was done.
10 The newspaper dropped the subject. This is the sort of
11 thing that happens to mining companies and smelters.
12 The public has always feared arsenic, an idea that is
13 fostered by the portrayal as a deadly poison by more than
14 one mystery novelist. It is a poison all right but only
15 in quantities or magnitudes greater than the concentrations
16 released by the smelter. There is no evidence with the
17 levels of arsenic in this area, that a greater cancer risk
18 is imposed.

19 Several years ago the public went through a
20 scare concerning cancerous health risks posed by selenium,
21 a sister element to arsenic. After much bruhawhaw and
22 costly laboratyr research, it was discovered that selenium
23 is a necessary element in the fight against cancer in the
24 human body.

25 Arsenic was used as a medicine before penicillin

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1 became available. It was the standard cure for syphilis
2 until the 1920's. The natural level of arsenic in
3 urine which is 20 to 50 micrograms is more than a factor
4 of 10 lower than the level of arsenic in urine following
5 consumption of a fish dinner, which brings it up to 500 to
6 1000 micrograms.

7 Industrial Mineral Products has been operating
8 as a contractor at ASARCO for almost ten years. It
9 began operating at a time when public awareness of possible
10 environmental changes due to industrialization was awaken-
11 ing. The battle cry, "The smelter must close" was all too
12 popular. Indeed, even we questioned the advisability of
13 starting an operation in an environment that was rumored
14 to be potentially hazardous. The decision had to be
15 based on both economics and the morality of placing others'
16 lives in potential danger. The decision was made after
17 review of all data available; facts, not rumor, suspicions,
18 fears or scientific untruths.

19 The same concerns have been kept in mind through-
20 out the ten years of operation. I know for a fact that
21 ASARCO has a strong feeling of responsibility for the
22 health of their employees and the residents of the area.
23 Our company also has workers in the immediate area of the
24 smelter. We're concerned with the working conditions of
25 their environment. We are convinced, not by any bias or

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1 prejudicial convictions, but by scientific data which is
2 periodically collected, that the employees are not subjected
3 to a working climate that is unhealthy.

4 I do not want to become involved in discussing
5 technical aspects of the dangers of arsenic.

6 We agree that the unknowns regarding arsenic in the
7 environment are of sufficient importance that the establish-
8 ment of reasonable emission standards is mandatory.

9 Therefore, I am encouraged to see that the standard is
10 about to be achieved, in spite of the incredible amount
11 of anguish the media hype causes . This demonstrates to
12 me at least that industry, the environmental agencies
13 and the general public can achieve a maximum of environ-
14 mental protection only when we all work together in an un-
15 emotional, logical matter to achieve the desirable goal.
16 I can only hope that this portends of things to come
17 rather than the adversary approach which has been all too
18 common in the recent past.

19 Unfortunately the media has devoted too much
20 time to the assumption that arguments surrounding this
21 matter of arsenic are soundly based. Surely responses
22 you have received from opponents of ASARCO who have little
23 knowledge of the technical aspects of the matter must
24 be filled with impassioned arguments and beliefs
25 based solely on articles presented solely by the news

1 media. ASARCO has cooperated with the EPA for standards
2 of control of arsenic emissions and I support the new
3 standards as a continuing effort to reduce even more
4 the risk, if any, that may exist by applying the best
5 available technology. Standards must be prepared under
6 which the smelter is to operate. I would like those
7 standards to be based on knowledge, not hearsay and fears.

8 Thank you.

9 HEARING OFFICER: We may have some questions.
10 Our motto, if you were here yesterday, I'm not saying
11 you should have been here yesterday but one reason was we
12 had the entire podium loaded with the press and all the
13 tables along the side loaded with newspaper media.
14 Your plea for objective and fair reporting would have been
15 heard not only by the nationals, CBS and NBC and so forth
16 but all of the local press. We will listen to your
17 plea today for fair and objective reporting. Thank you
18 for coming.

19 Any specific questions?

20 (No response.)

21 HEARING OFFICER: O.K., is (b) (6) here?

22 (b) (6): My name is (b) (6) and I
23 represent the Northwest Office of Friends of the Earth,
24 4512 University Way N.E., Seattle, WA 98105. Friends of
25 the Earth is a national environmental organization with

1 approximately 3,000 members in Washington, Oregon and
2 Idaho.

3 According to recently released internal EPA
4 memos, efforts to curtail arsenic emissions at the ASARCO
5 smelter have been smothered by EPA headquarters since
6 1976. A citizen's suit and a Federal Court order have
7 been necessary to force EPA to carry out their mandate of
8 protecting public health and the environment.

9 While we would like to support EPA's proposal for
10 installation of secondary hooding on the converters at
11 the ASARCO plant, ASARCO has recognized that such an
12 arrangement is economically beneficial to them, allowing
13 them more days of operation resulting in more, not less,
14 arsenic being vented up the stacks in the future. In
15 addition, arsenic emissions from the convertors may
16 represent only a small fraction of the total fugitive
17 emissions from the plant. Even after their installation
18 both EPA and PSAPAC agree that over 20 tons of relatively
19 highly concentrated arsenic will be released near ground
20 level into the local area each year. We also note that
21 DSHS epidemiologist, Sam Milham's, studies of urinary
22 arsenic levels in Ruston's school children have consistent-
23 ly documented levels three times higher than those of
24 children in a control group in Fern Hill.

25 Ambient arsenic monitoring around the smelter

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1 continues to show excessive 24-hour arsenic concentrations
2 in the Ruston area. Some of the recorded values have even
3 exceeded the limits set by the Federal Occupational
4 Safety and Health Administration for workers in the plant.
5 Despite many control actions made by ASARCO in the past
6 10 years, most accompanied by threats of closure, there
7 doesn't appear to be any reduction in the arsenic concen-
8 trations measured near the plant. This is also consistent
9 with Dr. Milham's findings. ASARCO believes that this is
10 due mainly to handling of the ores and subsequent arsenic-
11 laden dust being blown off the property. The present
12 EPA emission proposal fails to address this problem.

13 The failures of EPA's emission reduction
14 proposal exists because of their fundamentally wrong
15 approach to controlling the problem. EPA's approach of
16 simply requiring that industry use the "best available
17 technology acceptable to the regulated industry" will not
18 protect either worker or public health, or the environment
19 from arsenic poisoning. Rather, this policy only protects
20 the economic well-being of polluting industries.
21 Apparently, it is EPA's position that ambient air quality
22 standards cannot be set for carcinogens, because theoret-
23 ically there is no safe level of exposure, a view not
24 shared by many, including PSAPCA which has called for
25 such a standard.

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1 Tacoma Mayor, Doug Sutherland, has said that he
2 favors keeping the ASARCO smelter open until he is shown
3 evidence that the smelter's arsenic emissions are causing
4 cancer deaths here. This is precisely the approach
5 embodied in EPA Administrator Ruckelshaus' approach to
6 pollution cleanup at the ASARCO plant. We disagree. We
7 strongly disagree that the mission of EPA is to sit back,
8 hold the hand of industry and wait for cancer deaths.
9 Congress didn't legislate this approach. Congress required
10 EPA to protect public health with an ample margin for
11 safety. We applaud PSAPCA's efforts to control emissions
12 of arsenic from ASARCO and their request for an air quality
13 standard for arsenic. They have seen through the smog of
14 rhetoric spewing from ASARCO to the real issue. PSAPCA
15 and local residents have also demanded that EPA support
16 a voluntary health screening program. This is critical
17 because even should the 93 year old plant shut its doors
18 tomorrow, rather than in five years as EPA has projected,
19 damage to public health and the environment has already
20 been done and arsenic will continue to haunt Puget Sound
21 for decades to come. The risks posed by consumption of
22 local garden vegetables and seafood have been deemed
23 hazardous to health by the joint Pierce and King County
24 Health Departments. The especially high risk imposed on
25 infants, pregnant women and people with respiratory problems

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1 cannot be ignored, no matter how inconclusive the evidence
2 may seem.

3 For over 90 years now, ASARCO has been allowed
4 to dump its wastes on Puget Sound and the surrounding
5 communities. The build-up in the soil is so substantial
6 that even if the plant is closed, some residual risk
7 would still remain. The sheer magnitude of people affected
8 by ASARCO's operation demands that more actions be taken
9 to protect them.

10 Recent studies estimate health and property
11 damage at nearly \$100 million each year and that new
12 businesses are refusing to locate in Tacoma while the
13 smelter remains in operation. Unless EPA is persuaded
14 to reevaluate its proposed emission controls, we, the
15 residents of Puget Sound, will continue to bear an un-
16 reasonable cost and risk. We are here to send a strong
17 message to EPA and ASARCO. Clean up or shut down.

18 The Clean Air Act of 1970 represented a major
19 milestone in the development of human rights by establish-
20 ing for the first time in American legal history a right
21 to health. This right is embodied in EPA's mandate to
22 set air quality standards solely on the basis of public
23 health without regard to the profits of industry.

24 The mandate of the Clean Air Act clearly
25 reflects a decision by Congress not to empower a government

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1 bureaucracy with the authority to sacrifice lives so
2 that industries, such as ASARCO, can continue to be
3 profitable. Subsequently, the Supreme Court removed the
4 old common law remedies which allowed victims legal
5 recourse for their actions.

6 EPA's proposed standard allows for an unprecedent-
7 ed level of risk and marks a radical reversal of national
8 public health policy. The Senate Committee that enacted
9 the Clean Air Act clearly stated in Senate Report No. 1196:

10 "In the Committee discussions, considerable
11 concern was expressed regarding the use of the
12 concept of technical feasibility as the basis
13 of ambient air standards. The Committee deter-
14 mined that, one, the health of the people is more
15 important than the question of whether the early
16 achievement of ambient air quality standards
17 protective of health is technically feasible, and
18 two, the growth of the pollution load in many areas
19 with application of available technology, would
20 still be deleterious to public health."

21 Thank you for the opportunity to present
22 these comments.

23 HEARING OFFICER: Are there any questions?

24 (No response.)

25 HEARING OFFICER: Thank you, (b) (6)

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1 Mr. (b) (6) ?

2 (No response.)

3 (b) (6)

4 (b) (6) : My name is (b) (6)

5 I live in Tacoma and have worked for the Tacoma smelter
6 for 15 years and I was wondering if the people on the
7 podium there have ever been out to the smelter?

8 If you haven't been out there, why don't you go out.

9 MR. VERVAERT: I've been out there several
10 times in the last six months.

11 (b) (6) : How many years ago?

12 MR. VERVAERT: Just recently.

13 (b) (6) : Well, if you have been out
14 there 15 years ago you would have seen a world altogether
15 different than it is today. There were smoke stacks
16 that put out smoke that you could have walked across.
17 You couldn't tell where the stack stopped and the smoke
18 started. Down below it was just heavy and thick and if
19 you got too much gas, you got out of there. This is the
20 way the standards were set then.

21 Now since that time, you wonder what's happening
22 to the lead and the arsenic in the kids' blood or urine,
23 it's because it's not being put out anymore. The news
24 media took pictures of the smelter and there was staff
25 out there this morning. That was the big eyesore you had

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1 in the news media. Now, since that time it shows that
2 everything is going down, including the level of arsenic
3 in the urine. If you take and eat fish, you can't measure
4 it. You say you should eat fish every day, fish is good
5 for you, but you're going to have so much arsenic in
6 you urine you won't be able to put it on a scale but yet
7 fish is good for you. So how can you say arsenic is
8 bad for you unless you eat it in a form that is poisonous.
9 Arsenic in its purest form is not poisonous. It is the
10 compounds that make it poisonous. I feel the smelter
11 has been harassed by the news media who never show anything
12 good.

13 I believe the young lady who was sitting
14 right there, I'm not sure but I think she was on TV
15 news last night, am I right?

16 HEARING OFFICER: We have various people
17 here.

18 (b) (6): The newscast came from
19 Channel 5 and the new's question was, "How come you leave
20 that plant open if arsenic is killing people?" and the
21 lady here said that she thought that it caused cancer,
22 that's all she said. She said she couldn't prove it
23 but they want to shut this place down. The news media in
24 Seattle has always been that way. It has come down hard
25 on Tacoma, anything around Tacoma they come down on hard.

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1 Now the news media is supposed to be unbiased
2 but it is not. It picks out a place and then goes after
3 it. I have often wondered who wants this waterfront
4 down here. They want the smelter to close up. It has
5 been a good neighbor since 1914 except they had no controls
6 over the emission of pollution but technology has finally
7 come forward and the smelter is doing something about it.

8 If you had been there, like I say, 15 years
9 ago, you would see the difference. Very few people who
10 were there 15 years ago would walk by today and not see
11 the difference. The man before was talking about the bees.
12 He's going to use bees to find out how much arsenic is
13 coming out of the smelter. He has bees and he's around a
14 farm and the farmer is going to put down insecticides
15 full of arsenic to get rid of the bugs, so how is that
16 going to prove anything.

17 The trouble is arsenic has a bad name.
18 Throughout history it has been related to death. It's a
19 killer. Atomic energy has the same stigma about it.
20 It is associated with death, with the atomic bomb. But
21 where do we stop. We have to let up on something. If you
22 can't prove something and you feel that the man is trying
23 to clean up his yard, then leave him alone and let him
24 clean it up. But it doesn't seem like that is good
25 enough.

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1 Young lady, were you on the news cast last night?

2 MS. SMITH: No.

3 (b) (6): Well I want to thank you.

4 Like an old man I can sit and watch this go on for ten
5 years but it's always the same questions, the same people
6 bring up their graphs which they can't prove anything by
7 but they would like you to think that they can.

8 If you want to read about arsenic, you can get a book
9 from the Cadanian government that will tell you all about
10 arsenic. It doesn't say nothing about cancer there. It
11 just says it will kill you. It will make you kind of
12 nuts sometimes if you get a bunch of it. If you're around
13 insecticides, you're bound to have nausea or whatever
14 else, but you're working there. You're expected--if you
15 find this is going on, you'll step out a while until you
16 get back to your senses and then you go back in and do
17 it again. But as death, right out death, it's not what
18 they say it is. They'd like you to feel that way.

19 HEARING OFFICER: Thank you.

20 (b) (6), please.

21 (b) (6): Good morning. I hadn't
22 expected to be called yet. I am caught by surprise a
23 little bit. I think I will start out by reading a letter
24 which I sent to the EPA.

25 I feel I should speak in favor of ASARCO, Inc.

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1 I probably realize the hazards of chemical emissions
2 involved there better than most persons because I have had
3 personal contact with them. I worked at this plant for
4 30 years. I started in the laboratory and finished in
5 the office. I have first-hand working knowledge of the
6 smelter from the ground up.

7 My dwelling has been with (b) (6)
8 radius of the plant during that 30 years. My father died
9 at age 64½. My mother died at 57½. I am now 68. I am
10 having problems with circulation in my right leg which I
11 blame on 6½ years service in the defense of my country
12 prior to my service in the smelter as much as I do the
13 30 years in the smelter.

14 These statistics we've heard, I do not
15 disagree with some of the findings of some of the officials
16 such as Alexandra Smith in this region. I am sure she
17 must have better knowledge of the fallout from the smelter
18 than I. However, I do disagree with the effects your
19 organization has claimed is due to this fallout. Please
20 understand I am not saying there are no ill effects from
21 the plant in question. That would be like saying there
22 was none from the recent eruption of Mount St. Helens.
23 My relatives in the state of Kansas reported seeing the
24 clouds generated by the mountain but they have never
25 mentioned seeing any smoke from the smelter. This is

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1 far fetched perhaps but true. I realize there are a
2 lot of new jobs which have been created with the founding
3 of your organization and the results must be obtained
4 in order to maintain these jobs, but what of the jobs
5 in the basic industry. If they all terminated, who will
6 pay for the bureaucrats? This was signed by myself.

7 Going back to the founding of this smelter, I
8 am sure that the history has been discussed before. The
9 smelter is approximately 94 years old. I am wearing a
10 tie clasp and belt buckle made for the commemoration of
11 the 75th year of the existence of the smelter. Out of
12 that 94 years I can't understand why all of a sudden
13 the smelter is being belied by every organization. Why
14 hasn't it been done before?

15 This notebook that I've got here, this is 1983.
16 These are clippings that I've cut out here regarding
17 anything relating to the smelter. I've been saving these
18 scrap books for quite a while now. I'm retired and you've
19 got to have something to do. It is just amazing how
20 much information has been put out over the last year and
21 this is just one year, so imagine what's been going on
22 for the last four or five years. It would probably fill
23 quite a few volumes.

24 Is my time up?

25 HEARING OFFICER: If you want to make a note

1 for the record, we'll Xerox it and return it to you.

2 (b) (6) : Well the EPA already has a
3 copy of it.

4 HEARING OFFICER: Thank you very much.

5 Has (b) (6) come in?

6 (No response.)

7 HEARING OFFICER: We also have present
8 this morning (b) (6) and (b) (6).

9 (b) (6) ?

10 (b) (6) : My name is (b) (6).
11 I live at (b) (6) in Tacoma. I would like to
12 add my support to many of the comments made yesterday
13 and early this morning by the Washington Environmental
14 Council, the Sierra Club, League of Women Voters for
15 saving the environment. I am not going to repeat every-
16 thing they said but I do have a couple of technical
17 comments I would like to make however.

18 I have a Ph.D. in biological chemistry from
19 Northwestern University. I teach analytical chemistry,
20 instrumental analysis and environmental chemistry.

21 In Section B of the Federal Register the
22 analysis techniques for arsenic are outlined in some detail
23 and I think the EPA needs to reexamine these analysis
24 techniques in light of modern technology. Modern analysis
25 strategies are available and I recommend looking at

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1 electrical chemical and volatile metric techniques as well
2 as electroscopy. Electrochemical and voltametric
3 techniques would allow the simultaneous analysis of
4 cadmium and lead emissions and other substances emitted
5 from the smelter. On the other hand, x-ray spectroscopy
6 would eliminate problems with solubility of these substances
7 as mentioned earlier by Mr. Roberts and thus eliminate
8 the effects of insoluble substances. Also analysis
9 would be able to be accomplished on a much shorter time
10 frame. Perhaps the absolute quantitative data wouldn't
11 be quite as good but analysis wouldn't take two or three
12 days, it could be done in a half-hour or so. Further
13 details and references will be included in my written
14 comment.

15 Now I would like to make just a few other
16 comments. I would like to see monitoring data for air-
17 borne arsenic disseminated to the public as it becomes
18 available, particularly to the scientists in the area.
19 The EPA has been very willing to provide us with data
20 since July 11; pre July 11 it wasn't so easy to get ahold
21 of the data. It could be obtained only by going to
22 Region 10 office. Since then the EPA has been much more
23 willing to provide us with copies, etc. and I would
24 encourage that to continue. Also, as the State is related
25 I would like to encourage hearings be held so that the

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1 regulations under 112 can be updated.

2 Another point I would like to make is as
3 arsenic levels are measured in the soil and dust
4 surrounding the area, I hope it is released to the home-
5 owners and people who live in the area so that they can
6 judge themselves whether or not there's an arsenic
7 problem in their specific area. We know from the air-
8 borne patterns of the wind roads in the area, that some
9 people aren't affected but believe they are. It is
10 important that they know whether there is not or is
11 arsenic in the dust in the area of their home.

12 I support the establishment of an actual level
13 of .05 ug/m³ 24-hour average or a lower amount. When
14 this level is reached at any point outside the plant
15 boundary, operation should be curtailed, curtailment
16 activities as well as arsenic levels need to be made public
17 so that people can choose to modify their activities or
18 remove themselves from the area if they so choose.

19 Epidemiological studies need to be undertaken as well as
20 health monitoring of people who live near the smelter.

21 I recognize the important strategic need for copper as
22 well as arsenic. I want to see jobs for the people of
23 Tacoma but all residents, the workers and the people who
24 live in the area deserve a clean environment.

25 I trust the EPA will continue to devote a

1 portion of its financial resources to arsenic regulation
2 and clean up, either under Section 112 or the supervisor.

3 Last I would like to commend the EPA Office
4 and Ms. Alexandra Smith and Jim Barnes for action taken
5 which means that scientists like myself are willing to
6 provide information and this has been useful to us
7 following the issue. As I already mentioned, before
8 July 11th the information was not as forthcoming
9 and I feel PSAPCA had to carry the burden of the regula-
10 tions and supplying the information.

11 I think lastly the City of Tacoma also needs
12 some recognition for holding the October 6th round table
13 and I encourage the EPA to carefully look at this round
14 table format in future citizens participation projects
15 with other parts of the county on other issues. I think it
16 is very valuable for everyone to attend.

17 Thank you.

18 HEARING OFFICER: Thank you, (b) (6)
19 Any questions.

20 (No response.)

21 (b) (6) ?

22 (b) (6) : There are two sides of the
23 story to present and they, like most of us, were all in a
24 quandry because they had so many questions and the
25 scientific issues were not easy to clarify. With my

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1 testimony I am attaching some papers done by (b) (6)
2 Dr. Douglas Frost, who is a doctor in New York. He is
3 a nutritional chemist. The subject has been arsenic.
4 These papers are about nutrition, a seemingly unrelated
5 topic for this hearing's discussions. However, the questions
6 which arise when a company empties its cast-offs into
7 the air to settle on the land everywhere about the
8 territory include the one of nutrition. So we can't
9 ignore it. Is the arsenic becoming available to and
10 through plants and animals, that's first. Secondly is,
11 is that relationship harmful or helpful to us as human
12 beings dependent upon our nutrition from the land and sea?

13 The first question is much easier to answer than
14 the second question. There is a diagram of my father's
15 work here about the arsenic cycle but it also says we still
16 need a lot more study. Both need honest, scientifically
17 sound answers. The answers will take much more study
18 than presently fundable. Therefore, the decisions on
19 the question must be based on available information.
20 I've tried to make logical connections between what (b)
21 [REDACTED] says about the nutrient values of arsenic and the
22 smoke coming out of the tall ASARCO stack. One cannot
23 ignore that sulphur dioxide emissions are at stake here also.
24 (b) (6) work demonstrates that SO₂ counteracts the
25 good effects of selenium in the body, making that a

1 making that a pretty definite danger to health. But
2 the subject here is arsenic emissions.

3 I am a card-carrying environmentalist and
4 therefore prone to want the world to be an unpolluted
5 green paradise. I am willing to sacrifice a great deal
6 to have it be that way. But, as yet, there are not enough
7 of us who are ready to do that in order to have the lower
8 to make real changes. We are making quite a few changes
9 however. I am not saying that it would be easy to do
10 and this here today shows that it isn't, but our kids resent
11 the insane ways in which the world conducts its business,
12 in resource allotment, in pollution control and these
13 are but two. This is a decision that's a critical one
14 for the EPA to make.

15 If we do not require this region to do the
16 best that they can to clean up their effluent, then what
17 are we really saying? There has got to be enough arsenic
18 in the ground around the plant for miles and miles to supply
19 the nutritive needs for years, probably, if that is
20 shown that we need that for nutrition. So it wouldn't
21 rob the people on Vashon Island and In University Place
22 if the arsenic were to be removed. The recovered arsenic
23 can be sold as mineral pills for trace elements, like
24 we take our selenium pills each day, if we do, ineed need
25 more arsenic in our diets.

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1 The question of Harm seems moot, but it is not.
2 The fact is that we just do not know for certain what
3 overload will do in the future to the people involved,
4 and I am one of them because our family lived within
5 three miles of the smelter for 11 years and we our boat
6 is practically under the tall stack, and we do spend some
7 time right there. I submit that the navigation light from
8 one side of our boat as evidence that metals are badly
9 corroded by something present in the area. We had to
10 spend \$80 to replace these lights recently. The boat is
11 a 1968 model and has been moored near the smelter for
12 at least 12 years. We sail near the smelter and
13 occasionally the smoke comes straight down onto the water
14 and we breathe it directly. I personally experience
15 sore throats and general malaise when that happens.
16 The emissions are very real and they are not imaginary.
17 (b) (6) dares to ask the question, if they
18 do remove the arsenic from the emissions then will the
19 cancer rate go up? I submit that if SO₂ is also removed
20 in the process then we will at least come out even. There
21 is no excuse for not removing SO₂.

22 The way this in which the pollutants are removed
23 is to be negotiated. The smelter has its ideas and the EPA
24 has its ideas but not the financial information necessary
25 to make the best informed decision. My criteria is that

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1 the removal be effective and consistent. Whether or not
2 it is a new method of smelting ore or hoods, there
3 should not be large technical problems associated with start-
4 up, etc. The system should be on-line whenever the
5 smelter is operating, otherwise it will be easy to be
6 neglectful.

7 The smelter is an historic landmark in Tacoma/
8 Ruston. It supplies jobs. However, Tacoma has changed
9 its image and the smelter must change with it. It is time
10 for ASARCO management to put the necessary money into
11 the system to make it work and for EPA to require the
12 best available technology for the smelter.

13 I hope that you do take a look at my father's
14 work. I have included also some personal letters I wrote
15 asking him all of the questions I could think of
16 regarding cancer. If you have the chance I hope you
17 will look at this answers and I also hope you will
18 seriously consider the total matter.

19 HEARING OFFICER: Thank you. We will
20 receive for the record the material that you describe.

21 (b) (6) ? Will you please speak clearly
22 and stand close to the microphone.

23 (b) (6) : My name is (b) (6) .
24 I worked in the plant for five years and I am very
25 interested in this issue. The only way I can see out

1 of this predicament is to have a long tunnel, we
2 would enter into a tunnel and dispose of it there
3 rather than through a stack. Perpendicular stacks,
4 horizontal in a tunnel and then the people would all
5 be satisfied and that is the only way I can see. All
6 the companies would be happy about it. If they will
7 comply I have submitted a proposal and an idea that would
8 benefit everyone.

9 We cannot stop progress so if propose we put
10 it under ground, all the waste material and such and
11 then it will be taken care of from there. If I had the
12 opportunity to meet with engineers I could explain it in
13 every detail. That's been in this brain for five years
14 and I would like to see that done before I past away
15 because it's been there ever since I came out of
16 the United States Navy and I don't know how long before
17 and I maintain that no stack should be perpendicular
18 but rather horizontal. That goes for all concerned, all
19 companies but that way we can appease the company and
20 everyone concerned. That must be presented and I am sure
21 they will comply.

22 Up until that time that they've been shown that
23 it will better the community, the EPA and the whole works
24 and it's worth saying. If I could meet with an engineer,
25 I could explain it thoroughly and in more detail. But I

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1 do get emotional because I have worked on this plant
2 and I know every detail. If someone would have me
3 presented to an engineer, I could explain it. That's
4 about all I have to say.

5 HEARING OFFICER: Mr. Ireland, we have until
6 December 10th to submit materials for the written record.
7 If you have drawings or something or suggestions in
8 greater detail, you have until December 10th to submit
9 them.

10 MR. IRELAND: I drew up some prints and
11 took them to Lacey. That was five years ago under the
12 orders of Dixie Lee Rae and what they did with them, if
13 they shredded them, I don't know but that is the way I
14 look at the situation. They must be put into a tunnel
15 underground and then we could go from there. I have
16 details on it but at this present time, that would be the
17 first step to take.

18 HEARING OFFICER: All right, thank you very
19 much.

20 (b) (6): Thank you.

21 HEARING OFFICER: (b) (6) ?

22 (b) (6): My name is (b) (6).
23 I live at (b) (6). I worked the smelter for
24 37½ years and the job I had, I used to go into all the
25 departments and check all the trains going through the

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1 dust in there and I don't think there's a sign that I
2 have cancer.

3 HEARING OFFICER: Thank you very much for
4 your testimony.

5 (b) (6) ?

6 (No response.)

7 HEARING OFFICER: (b) (6)

8 (No response.)

9 I don't see the individuals I've been calling
10 up so we will call them again at this afternoon's session.
11 Are there any others who would like to testify, somebody
12 who may have come in?

13 I see one individual. Please give us your
14 name. Identify yourself for the record. You have ten
15 minutes.

16 MR. ANDERSON: My name is Bill Anderson
17 and I am from the Tacoma-Pierce County Economic Develop-
18 ment Board.

19 The Tacoma-Pierce County Economic Development
20 Board is a public-private, county-wide, economic develop-
21 ment organization comprised of the major general purpose
22 units of government in Pierce County, the Port of Tacoma,
23 and nearly forty private sector organizations. The
24 executive committee of the EDB has adopted the following
25 position with regard to the ASARCO smelter controversy

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1 in Tacoma.

2 The Tacoma-Pierce County Economic Development
3 Board strongly supports efforts to significantly reduce
4 or eliminate potential health hazards to our community
5 from industrial sources as well as an intensive community-
6 wide program of retaining viable existing industry and
7 attracting new business and industry to diversity our
8 industrial base.

9 Community decisions which attempt to balance
10 the impacts of potential health hazards with jobs and
11 other community benefits need, as much as possible, to be
12 based on fact and not perceptions. In the case of
13 ASARCO, we support the efforts of the company and the EPA
14 to adopt the best technology currently available and
15 encourage that process to proceed as quickly as possible.

16 HEARING OFFICER: Thank you, Mr. Anderson.

17 MR. O'CONNOR: I have a question. Are
18 industrial development bonds available in this area?

19 MR. ANDERSON: Through the Economic
20 Development Corporation for Tacoma-Pierce County.

21 MR. O'CONNOR: Thank you.

22 HEARING OFFICER: At this time we will have
23 a short pause. I would like to thank the audience for
24 its patients and for those of you who have testified, for
25 the quality of your testimony. We find that everyone has

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1 something to add to the transcript and we're really
2 quite pleased with the extent to which you have prepared
3 your remarks and the forthright nature that you've
4 used in coming forward and expressing yourself.
5 This is part of the public process and we really want
6 to thank you as an audience for having come forward in
7 this regard.

8 Tomorrow morning we're going to continue and
9 of course we're going to continue also this afternoon and
10 this evening here, but tomorrow we're going to have
11 additional, a third session, and unfortunately that
12 session can't be here. It is going to be at the Stanley
13 Elementary School and that is at South 17th Street.
14 They have instructions at the table outside the door
15 for those of you who want to follow these sessions.

16 At this time I am going to adjourn the session
17 15 minutes early and we will reconvene at 1:00.

18 (Hearing recessed at 11:45 a.m.)
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1 AFTERNOON SESSION

2 (1:00 p.m.)

3 HEARING OFFICER MOORE: The hearing
4 will please come to order. This is a resumption of the
5 hearing on proposed arsenic standards. I just want to
6 take a moment summarize the rules of the hearing so that
7 those who have not attended the prior sessions will
8 understand what the basic rules are.

9 The purpose of the hearing is to take testimony
10 from members of the public relating to the proposed
11 arsenic standards. The EPA panel if they wish will ask
12 questions of the witnesses and I'll take just a moment
13 to have the panelists again introduce themselves, starting
14 with Mr. O'Connor.

15 MR. O'CONNOR: I am John O'Connor,
16 Chief, Economic Analysis Branch, Research Department,
17 North Carolina.

18 MR. PATRICK: I am David R. Patrick, Chief,
19 Pollutant Assessment Branch, also Research Department.

20 MR. JOHNSTON: Mike Johnston, Chief, Air
21 Operations Section, Seattle.

22 MR. SALO: I am Earl Salo, with the
23 agency's Office of General Counsel.

24 MR. GAULDING: I am Clark Gaulding, Cheif
25 Air Programs Branch, Region 10, office in Seattle.

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1 HEARING OFFICER: And I am Jim Moore,
2 Hearings Officer.

3 Now the rules regarding testimony are as
4 follows. The time limits for oral remarks is 10 minutes.
5 When the witness has testified for 9 minutes, the
6 Hearing Officer will notify the witness that the witness
7 has one minute left. When that minute is up, the testi-
8 mony will have to come to an end. Anyone who testifies,
9 even those who do not testify, will have a right to
10 submit written material for the record. This written
11 material may be submitted by placing it in the box here
12 up front or by mailing it to EPA. The address can be
13 obtained from the registration desk at the back. You may
14 submit the material until December 10, 1983, whether you
15 testify or not.

16 With respect to any visual materials, slides,
17 photographs or those types materials that may be used,
18 you must submit a copy for the record so that when the
19 panel makes their decision and they review the record,
20 they examine everything that is in the record, including
21 visual materials, anything that is presented at the
22 hearing.

23 Your schedule time is approximate as it may
24 take less time than allotted and it may be, because of
25 the questions of the panel, that it runs a little bit

1 longer than we anticipated. So your time really is just
2 approximate.

3 Since a record of the hearing is being made,
4 when you come forward and testify, please identify
5 yourself. Please come up to the podium and identify
6 yourself and then give the testimony. The court reporter
7 needs to be able to hear everything that is said by the
8 witnesses.

9 At tomorrow's hearing--tomorrow's session of
10 this hearing will not continue at this location. We do
11 not have this facility available tomorrow. The hearing
12 will be at the Stanley Elementary School, 1712 South 17th
13 Street. I am told that is one block from Spring Avenue
14 here in Tacoma.

15 The first witness scheduled for this afternoon
16 is (b) (6). Is (b) (6) here?

17 (b) (6), would you come forward? While you
18 are coming forward, I will ask if (b) (6) is present?
19 (b) (6) is present. And whether the (b) (6)
20 is present.

21 (No response.)

22 HEARING OFFICER: Identify yourself please.

23 (b) (6): My name is (b) (6). I
24 am a retired railroad engineer. I just wish to state
25 that I never worked for the Tacoma smelter nor do I know

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1 anyone who ever worked there myself. But there is a lot
2 in this world--pardon me, I must start over again.

3 There is not a man, woman or child who doesn't
4 want to clean up the environment. However, I must ask
5 at what price, at perhaps 50 percent unemployment?
6 Environmentalists will definitely dodge this one. They
7 will say something like, "That's not true" but it is
8 becoming truer and truer as time goes by, that our
9 government keeps pretending the unemployed are not there.
10 Now people are understandable as far as their individual
11 wants and desires are but may I ask you just what the
12 total cost may be in responding to the individual desires
13 and needs of a few who contend that their lives and
14 livability may be in jeopardy while in reality a few
15 real people are going hungry and the industry which could
16 provide many people with jobs is shut down by a few
17 meaningly harmless people who feel their lives are being
18 ruined by people who desire to make an honest living.

19 In old times people knew there were certain
20 things in the air that you breath but if it's an
21 environmental concern, you better not burn it.
22 What I am trying to say is that we had best come to some
23 kind of reasonability or we will all be in real trouble.
24 Let's try to live in our environment understanding that
25 God did not make us perfect nor will our environment be

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1 perfect and for the benefit of all, we must take the
2 good with the bad. The basic thought is that if industry
3 wants to survive, it will have to pay the price; that
4 being ceasing its operations or in many instances going
5 bankrupt. If it were not for the industries, this nation
6 would not be a nation and yet some people insist on rules
7 and regulations that are there and will destroy this very
8 aspect, what really makes this nation what it is today.

9 I am one of the silent majority who feel it is
10 time to speak out. But another point I would like to
11 make is that this is no longer a nation of majority rule
12 but a nation of individualism and that is if the silent
13 majority doesn't hear you, believe me, people, if the silent
14 majority is ever heard from on the issues you have before
15 you today, you do not have a chance of shutting down
16 anything, any industry. We are, as taxpayers and citizens,
17 going to have to pick up some of the costs that are
18 necessary to provide the clean air we desire. We cannot
19 shut down an operation

20
21
22 We must work for the common good, not just for this
23 special thing or that special thing or as sure as there is
24 a God in heaven, we will all perish. This nation was
25 founded on a government of the people, by the people,

1 and for the people. It is obviously true that any
2 people who complain, no matter how few, should be listened
3 to by the government and judges but as I said before,
4 let's try to get back on the road to what this country
5 was founded on, not by minority rule but by majority
6 rule. There is more than just right and wrong involved
7 than in just the continuing operation of the ASARCO plant.
8 I guess it's the injustice of what could happen here
9 in a hearing before a governmental agency that has got
10 me out of my rocking chair to appear here today.

11 Thank you.

12 HEARING OFFICER: Thank you, (b) (6)
13 Do any members of the panel have a question of (b) (6)

14 (No response.)

15 HEARING OFFICER: Thank you, (b) (6).
16 (b) (6).

17 (b) : Thank you, Mr. Moore, and
18 panel members. My name is (b) (6), (b) (6).
19 I am (b) (6) of Piece County Central Area
20 Council. I would like to speak in that regard.

21 It is appropriate to offer a thank you to
22 EPA Administrator, William D. Ruckelhaus and the staff
23 for providing not only this public hearing but all of
24 the communication and education efforts on this difficult
25 subject leading up to today and the hearing for these

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1 three days. The process has enabled us to give
2 consideration to the questions raised and the significance
3 of any environmental actions taken.

4 As workers we have always been concerned with
5 and demanded a safe and healthful workplace. That same
6 concern and demand also translates directly to our homes
7 and our community. Having never seen the question of
8 today's hearing as a jobs versus environment one, we
9 are pleased to observe the apparent consensus building
10 among all responsible groups and individuals that what
11 we are attempting to address is the somewhat empirical
12 ample margin of safety called for in the Clean Air Act
13 as the critical issue of this standards-setting process.

14 The real consideration was posed by Northwest
15 Regional Administrator, Ernesta Barnes, last July when
16 she stated, "The question facing citizens affected by
17 ASARCO arsenic emissions is whether the reduced health
18 risk is acceptable."

19 There can be only one acceptable answer; yes, but .
20 Yes, but given the doubts about presently available scientific
21 evidence and data, we recognize the threat of further
22 delay which in turn would delay the time when the reduction
23 of present levels of emission will be accomplished and
24 therefore urge the timely continuing action leading towards
25 final adoption of the proposed standards.

1 Yes, but given the doubts about presently
2 available scientific evidence and data, we strongly
3 urge the EPA and other federal agencies to proceed in
4 seeking a greater body of knowledge of the possible hazards
5 of all so-called "no threshold pollutants" including
6 inorganic arsenic so that the public may become aware
7 of any effects from exposure rates.

8 And yes, but given the possibility of ultimate
9 conflict resulting from the implementation of the foregoing
10 and the known reality of continuously developing
11 technology, we urge a periodic staff review of the
12 standards and then additional public input if and when
13 consideration of major amendment seems appropriate.

14 Now in urging adoption of the proposed standards
15 and accepting the reduced health risk, what alternatives
16 are we rejecting?

17 We reject further delay in applying available
18 technological improvements. We reject the notion that
19 some solution to our industrial challenges will appear
20 at some point in time as if by magic. We reject the naive
21 premise that life ever has been, is now or ever can be
22 totally risk-free.

23 I recognize the decisions which face the Agency
24 are tough ones. This is a community which has quite
25 recently rededicated itself to an enrichment of civil

1 well-being. I am proud to be a part of such a community.
2 One reason for that pride is witnessing the determination
3 of the community to make the tough decisions and move
4 ahead. That is the way the common interest is best
5 served.

6 Thank you very much. I would like to note
7 that if I have orally misspoken anything, the written
8 statement has been submitted to the Regional EPA Office
9 in Seattle.

10 HEARING OFFICER: Thank you, (b) (6).
11 Any questions from the panel members?

12 (No response.)

13 HEARING OFFICER: Thank you.

14 (b) (6) ? Is (b) (6)
15 here?

16 (No response.)

17 (b) (6) ,

18 (No response.)

19 (b) (6) ?

20 (No response.)

21 (b) (6) ?

22 (No response.)

23 HEARING OFFICER: Let me go back to a
24 couple of names that were called this morning but were
25 not present in an attempt to see if they're present this

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1 afternoon. One of the names is (b) (6) .

2 (No response.)

3 The other name is (b) (6) .

4 (No response.)

5 I have called the names that were to testify
6 between now and 2:00 o'clock.

7 (b) (6) . Would you like to come
8 forward and testify. You just came in, is that correct?

9 (b) (6) : That's correct.

10 HEARING OFFICER: Just so you understand
11 the rules, each statement is limited to ten minutes.

12 (b) (6) : I won't be any longer than
13 that.

14 HEARING OFFICER: If you get to nine minutes
15 I will let you know that you have one minute left. When
16 you come up to the podium, identify yourself for the
17 record.

18 (b) (6) : I am (b) (6) . I
19 live at (b) (6) . I've lived in Tacoma all my
20 life and I just have a few things that I want to comment
21 on.

22 I've been reading about this thing with the
23 smelter and the arsenic for many years. I worked on a
24 construction project down at the smelter a few years back
25 where they put in the facilities to take out a lot of the

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1 arsenic and different things from their smoke stack and
2 what not. It just seems to me that the smelter is being
3 crucified by the tactics that are being used. The
4 newspaper commentary, practically every night for weeks
5 and months, contains articles about arsenic and how bad
6 arsenic is for the public and there is very little comments
7 made on what the smelter is doing about the arsenic
8 and anything favorable it seems lands in the back pages.
9 I've thumbed through it and read a few articles back
10 there and I think it is just unfair that the news media
11 is doing what they have been doing. They go on and on
12 about arsenic and how bad it is for a person's health.
13 O.K., I realize something should be done and it should
14 be investigated to find out just what is being done and
15 how harmful it is.

16 My idea too is what is being done for other
17 things. It is harmful to the human body. It is killing
18 hundreds of thousands of people all over the United States
19 and you don't see anything on the front pages of the paper
20 or even in the back pages, things like tobacco, alcohol,
21 drugs and things like that.

22 O.K., to get on with it, I've read the different
23 reports and things and it seems to me, what I've found out
24 is the human body needs arsenic as one of its elements
25 in order for the human body to live. Doctors have reported

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1 this. You need it in your regular diet. You get it
2 from food. I imagine the way it is is foods pick it up
3 from the soil and what not but you need this in order
4 for your body to function and live. O.K., the doctors
5 say a small amount of arsenic will not harm you.
6 Evidently it won't because you need it in your body to
7 live. O.K., the doctors say a small amount of arsenic
8 evidently will not cause cancer. Actually it doesn't
9 cause cancer, a small amount of it, because we have it
10 in our bodies, all of us do. We have to have it to live.
11 Another thing is they have found out that a certain
12 amount of arsenic does not cause cancer. A large amount
13 can and will but a small amount does not. It actually
14 will attack cancer cells. Now how far they've gotten in
15 terms of that, I don't know.

16 O.K., to get on with it, the question is how
17 much can the human body take to where it won't harm you.
18 I read in the paper it's way up here or it's way down here
19 (indicates). EPA or nobody has come out and said exactly
20 how much it will take or what's an intermediate level
21 where it won't harm you. It seems like it goes on and on
22 and on. I imagine that's what this body is for, to try
23 and find out just what that amount is. It seems like
24 the EPA before said "This is the amount the smelter can
25 have" this or that or different ones can have where it

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1 won't harm the body. O.K., the smelter goes ahead and
2 does that and has that figure and then later on the EPA
3 tells them to go lower and lower. What I would like to
4 see is a figure, a definite figure, arrived at to where it
5 won't harm the public and where the smelter can go on
6 operating.

7 Now we're talking about things that are
8 dangerous. O.K., arsenic is dangerous if you take a
9 large amount. It can cause cancer, it can even kill you.
10 Now let's take that. Aspirin is one of the miracles of
11 modern medicine. You take a handful of them and it can
12 kill you. Vitamin A, you need it to live. The same thing,
13 you take too much of anything and it can harm you. Arsenic
14 is the same way. So I just have to say, let's find out
15 just what amount can harm the human body, the public,
16 and go on from there and let the smelter try and meet
17 these standards. If they can, let them get back to work,
18 get on with their work.

19 That's all I have to say.

20 HEARING OFFICER: Thank you, (b) (6) .
21 Any members of the panel have questions of (b) (6) ?

22 (No response.)

23 HEARING OFFICER: I guess not. Thank you.
24 (b) (6) ? Now I want to be sure you under-
25 stand what the rules are. As far as testimony, each

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1 person is limited to 10 minutes of testimony and when
2 you step up to the podium, identify yourself and speak
3 into the microphone.

4 (b) (6): Well I am here to say that
5 I really don't think the smelter is causing any deficit
6 to Tacoma. With temperatures so high everywhere else,
7 I don't see how anybody can say that. I agree with the
8 standards EPA has set up for them because I know the
9 smelter is willing to do that much but I don't really
10 think they've caused any damage or deaths.

11 That's all I've got to say. Thank you.

12 HEARING OFFICER: Any questions?

13 (No response.)

14 HEARING OFFICER: Thank you (b) (6).
15 Just for the record, you are (b) (6) from Tacoma,
16 Washington?

17 (b) (6) Yes, that's right.

18 HEARING OFFICER: Thank you very much.

19 Now we have (b) (6) ?

20 (b) (6): I am (b) (6), (b) (6),
21 Tacoma, Washington.

22 HEARING OFFICER: Please go ahead.

23 MR. YOUNG: The smelter in the city has
24 been here many, many years employing many people including
25 myself until (b) (6). I worked in some of the worst areas

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1 in the smelter while I was there for almost 20 years.
2 There were some skin irritations, et cetera but those were
3 taken care of with no ill effects.

4 There are people that I have known working in
5 some of these worst areas that lived well into their 80's,
6 85, and had very good health. Some people had bad health
7 when they went to work there and still work many years.
8 I've seen the smelter spend millions of dollars on
9 pollution control to clean the place up. It is a
10 continual process in the plant, cleaning up the environment
11 and I am sure they will try to meet the EPA standards.
12 Thank you.

13 HEARING OFFICER: Thank you, (b) (6).
14 Any questions of (b) (6) ?

15 (No response.)

16 HEARING OFFICER: Thank you. Is
17 (b) (6) here yet?

18 (No response.)

19 Is (b) (6) here?

20 (No response.)

21 Is (b) (6) here? Would you please step
22 up to the podium.

23 (b) (6): My name is (b) (6)
24 and I am an attorney currently practicing in Seattle. I
25 am appearing before you today as a former resident and

1 lawyer in Tacoma's north end and as one of the founders of
2 Tahomans for a Health Environment.

3 Perhaps I should also indicate that I have in
4 the past served as Associate for Law and Ethics and Chief
5 of the Office of Health, Law and Values in the California
6 State Department of Health and as Chairperson of the
7 statewide committee in California responsible for reviewing
8 all research and experimentation involving human subjects
9 for which the State of California was responsible. I have
10 also served on a similar committee in the State of Washing-
11 ton. I have a doctorate from the University of California
12 at Berkeley.

13 I mention all this because it relates to the
14 perspective I would like to bring to my testimony before
15 you today.

16 The EPA, with its regulatory process regarding
17 arsenic and these hearings, is conducting a massive
18 experiment using the people of Tacoma and the surrounding
19 communities, both workers and residents, as human subjects
20 or, as some would say, guinea pigs.

21 Now if you accept this premise, and I will
22 attempt to argue why you should, then it follows that the
23 EPA must adhere to the moral and ethical principles that
24 govern human experimentation. These principles are not
25 specific, but they find their roots in such historic

1 doctrines as the Nuremburg Code and the Declaration of
2 Helsinki. One of the cardinal precepts that echoes through-
3 out these ethical and moral codes is that human beings
4 should be treated as ends in themselves and not as means
5 to an end.

6 Now, how does this approach apply to the ASARCO
7 situation and EPA's search for an appropriate regulatory
8 policy for arsenic emissions?

9 In the first place the issue at hand has been
10 framed as a contest between health and jobs. In a very
11 narrow and distorted sense this may be one way of saying
12 it. But in a larger sense the issue is profits verses
13 health, the health of workers and community residents
14 verses the profits that are achieved for the benefit of
15 stockholders and owners of ASARCO. The question then is
16 how much exploitation of the health, welfare and safety
17 of both workers and community residents is acceptable
18 in order to produce the profits for those stockholders
19 and owners?

20 At some point one might ask about the relative
21 toxicity of arsenic. You have heard much about this
22 already and will doubtless hear more. For my purposes, it
23 is sufficient to say that arsenic is, beyond any shadow of
24 a doubt, a human carcinogen, but that a very great deal
25 remains to be learned about it. How long does one need
to be exposed to experience adverse effects? How great

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1 does the exposure need to be before it becomes unhealthy?
2 What exactly are those adverse effects? How long will
3 it take for them to show? What difference does it make if
4 the exposure is by different routes: ingestion, inhalation,
5 touch, et cetera? What difference does it make if the
6 person exposed is male, female, pregnant, a child or
7 embryo, an asthmatic, a smoker, an elderly person and so
8 forth? All of these are questions for which precise
9 authoritative answers are not known or at least not agreed
10 upon.

11 We may be somewhat condescendingly amused or
12 shocked today at the ancient or primitive civilizations
13 that practiced human sacrifice for what they considered
14 the good of the tribe or the nation. But, I submit to you
15 that perhaps, I hope so, in the future people will look
16 back at us today with the same kind of condescension
17 or shock when they see us making human sacrifices of
18 workers and community residents for the sake of producing
19 and selling copper and its by-products for a profit.

20 I might add here that the issue before you
21 today has been cast in terms of the Tacoma and the
22 surrounding community pitted against itself, workers
23 community residents, labor against environmentalists.
24 This is unfortunate and again not accurate. It is a
25 question again of the use of a community and all its

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1 people and its environment as a means to an end, the
2 end being the expropriation of profits elsewhere.

3 In this context, the workers' interests are
4 formally represented by their union, the corporation's
5 by management and ownership and the community by who?
6 The grass roots community organizations? Government?
7 It is significant in this regard that ASARCO is widely
8 regarded as being the very negative example of a
9 community citizen, dragging its feet when it comes to
10 protecting the health of the community, contaminating
11 when it can get away with it and resisting environmental
12 controls every step of the way and then cynically promoting
13 the idea that the real struggle is between jobs and the
14 environmentalists, as though ASARCO, a multinational
15 corporation, represented best the community's interests.

16 William D. Ruckelshaus in his speech last June
17 to the National Academy of Sciences said that a very
18 important task of the EPA in the years ahead would be
19 to assess the nature of the risks of pollution to which
20 communities are exposed. As I indicated earlier, his
21 perspective and these hearings and the role of the EPA in
22 respect to the establishment of arsenic regulations, all
23 constitute an experiment on a massive scale.

24 EPA has the power to prohibit arsenic emissions
25 altogether. If it does not completely prohibit but rather

1 allows some emissions, any emissions at all, the EPA
2 will be in effect unleashing a known carcinogen on the
3 community, and on ASARCO's workers too, whose precise
4 effects are not all known. The EPA says it wants to
5 find out what those effects are, to assess the risks.
6 In other words, by permitting any emissions at all, a
7 decision will have been made by EPA to use people as
8 human subjects in research, just as Ruckelshaus has
9 assured the public that this will be done.

10 This is very serious business. The risks
11 affect substantial numbers of people, there are potentially
12 fatal or very significantly adverse effects on human
13 health. They could impact upon people in ways that
14 escape detection and they could take a long time to show
15 themselves.

16 There are a number of moral and ethical impar-
17 tives that flow from any decision that EPA might make in
18 this regard to permit continued emissions at any level.

19 One is that the EPA must commit itself in
20 concrete and specific ways as a condition of allowing any
21 emissions at all, to an extensive, rigorous pursuit of
22 knowledge about the adverse effects on human health of
23 those emissions. This will and should require the
24 expenditure of perhaps millions of dollars for research
25 that could span as long as 40 or more years and could

1 involve thousands of human subjects as participants in
2 the research. This commitment is the equivalent of the
3 precept in the Declaration of Helsinki that the research
4 objectives be proportionate to the risks to which the
5 subjects are exposed. If the EPA is unwilling to make
6 this commitment, then it follows that the EPA should not
7 permit emissions.

8 Second, there is a precept of the Declaration
9 of Helsinki that the doctor in an experiment be and remain
10 the protector of the life and health of the human subject
11 on whom the experiment is carried out. In this context,
12 the EPA should take steps to make sure that the health
13 care needs of people who are exposed to arsenic that the
14 EPA permits to be emitted are taken care of.

15 In other words, morally and ethically, if the
16 EPA is going to jeopardize people's health and if someone
17 does get sick or diseased, the EPA should pay for that
18 person's health care, or perhaps ASARCO should pay for it.
19 In this regard, I support the position of Tatomans for a
20 Health Environment that a bond or health fund be establish-
21 ed by ASARCO to care for people who are hurt by their
22 continued operation.

23 Another precept of the various moral and ethical
24 codes, including the Declaration of Helsinki, is that the
25 human subjects should give their informed consent to

1 being participants in the experiment. In a sense these
2 hearings can be seen as a way of obtaining the informed
3 consent of the community. In another sense, the fact
4 these hearings are being held at all adds credence to
5 the preception that what is taking place is a huge experi-
6 ment.

7 However, in a consent process the risks and
8 purposes of the experiment must be fully explained and
9 the experiment cannot be conducted without full and
10 free consent of the participants. This raises very import-
11 ant questions as to the rights and health of those who
12 don't want to be participants in this experiment. Should
13 they be required to move? Is their consent voluntary
14 if they have no choice but to remain because they cannot
15 afford to move from their homes? Again the moral and
16 ethical implication of this is that, because some may be
17 unwilling participants, the EPA and/or ASARCO are under a
18 profound obligation to monitor scientifically the effects
19 of any decision to allow any emissions to continue and to
20 provide for the health care needs of the participants
21 that may result from the exposures thus permitted.

22 I am not, by the way, saying that the EPA or
23 ASARCO should take care of the general health care of the
24 participants; just those needs or health problems that
25 might reasonably be suspected or deemed to result from

1 exposure to arsenic.

2 Finally and again consistent with the precepts
3 of the Helsinki Declaration, the experiment should be
4 discontinued if harmful effects are determined to
5 result. That could mean that the moment any adverse
6 effects are identified, that the experiment should not
7 be allowed to continue.

8 By way of conclusion, I would like to state
9 my position then. I believe that the regulations on
10 arsenic should be so strict that the emissions are
11 vanishingly nonexistent and that the health risks are as
12 well. This places the promotion of life, health and safety
13 of workers and community residents as preeminent and
14 does not allow them to be used as a means to an end,
15 as human sacrifices. However, if emissions are permitted
16 by the EPA, then the moral and ethical principles that
17 guide experiments on humans come into play, rigorous,
18 scientific monitoring, proportionate in scope, duration
19 and expense to the risks involved, health care for those
20 adversely affected by the emissions and discontinuance
21 if adverse health effects are established. No other
22 alternative is morally or ethically acceptable.

23 Finally I would like to say that I fully endorse
24 the position of Tahoma for a Healthy Environment and
25 commend it to your attention.

1 Thank you for the opportunity to present my
2 testimony to you today. I endorse the position of the
3 Tatomans for a Healthy Environment. Thank you very much.

4 HEARING OFFICER: Now I will check again
5 to see if (b) (6) has come to the hall?

6 (No response.)

7 HEARING OFFICER: (b) (6) ?

8 Is (b) (6) in the hall?

9 (No response.)

10 (b) (6) ?

11 (No response.)

12 HEARING OFFICER: The next name is

13 (b) (6) . Is (b) (6) here?

14 (b) (6) would you come forth to the podium
15 and identify yourself.

16 (b) (6) : My name is (b) (6)
17 and I live at (b) (6) in Tacoma. I was born
18 about five blocks from the smelter and I've lived most
19 of my life around within (b) (6) from the
20 plant. I'm 76 years old now and I'm retired. I put 35
21 years inside the plant, for 29 years of that handling
22 the ores and the dust in the smelter. I don't think there
23 is any danger of arsenic hurting anybody. In the past
24 testimony that I've heard I've come to the conclusion
25 myself that nobody knows how much arsenic it takes to kill.

1 When we were out on strike in '76 and in '78,
2 I was coming across the Orchard Street near South Park in
3 Tacoma one day and the smelter was down. It was not running,
4 it hadn't been running for months and there was a strong
5 sulfur smell in the air. I checked it out and it was
6 coming from the paper mill, so I think maybe the EPA
7 should stick around and see if somebody else is causing
8 all this here trouble that the smelter is getting blamed
9 for.

10 I do go along with the EPA and the smelter has
11 conceded to go along with them and build these hoods for
12 the converters. That's going to benefit the workers
13 down there. It's not going to benefit anybody else because
14 I don't think there's that much arsenic that escapes.
15 Another thing, I think the news media should be cautioned
16 about scattering scare tactics to the people because a
17 lot of people take things wrong, things that are put in
18 the paper, because they've wrote that way, so they will
19 misconstrue what they mean. And another thing, I think
20 Pierce County Air Control should fall within the limits
21 of what the EPA says, not what they said but what the EPA
22 says and then all industry could live with that.

23 That's all I have to say. Thank you.

24 HEARING OFFICER: Thank you, (b) (6)

25 Any questions for (b) (6) ?

1 (No response.)

2 HEARING OFFICER: Thank you.

3 Are (b) (6) or (b) (6) here?

4 Would you come forward (b) (6) and I would just
5 like to remind you that each witness is limited to ten
6 minutes. When nine minutes are up, I will let you know
7 that you have one minute left. Step forward and please
8 identify yourself for the record and come to the podium.

9 (b) (6) Thank you. I hope you are
10 as nervous as I am.

11 A few days ago I wrote a letter to the Tacoma
12 Tribune and (b) (6) saw it and called me and
13 asked if I would come up here and read it.

14 Over the years we have heard about the Tacoma
15 smelter smoke emissions and the smoke it gave off. Even
16 years ago when it was shut down for a couple of weeks
17 people complained about the odor, not realizing that the
18 smell came from the pulp mill and the tideflats, which
19 proves most people didn't even know where the smelter
20 was located. Now the EPA has really got its fingers in
21 the smelter's business, even though the smelter has spent
22 millions trying to abide by the rules and regulations,
23 which is just next to impossible. I know from experience
24 in dealing with the EPA this is so.

25 Now the question of too much arsenic. Why, after

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1 all these years are they or someone trying to shut down
2 the smelter. That means a lot of people are going to be
3 out of work, not to mention losing the pensions they've
4 worked for all these years. There is also the loss of
5 revenue to the City of Tacoma. With all the easily
6 accessible drugs, tobacco, alcohol, carbon dioxide and
7 motor vehicle emissions, not to mention the chemicals
8 that are put in the soil and on wheat that goes into the
9 bread that has affected people of all ages. What is a
10 little arsenic? Wake up, people of Tacoma, and quit
11 letting an organization like the EPA and the Chamber of
12 Commerce put another business out of business."

13 Now I had several telephone calls congratulating
14 me on my letter and I also got a letter from some people
15 I don't even know who used to live here, in fact they
16 lived here for 20 years. They now live in Port Orchard.
17 She gets the Tacoma Tribune and she says that she keeps up
18 with the news. She notices in the obituaries that a lot
19 of people have died who retired from the smelter. One
20 was 80 years and the other was 88. She says keep up the
21 good work.

22 Now here's a little personal comment, I think
23 I have enough time. I personally have a good idea of
24 what the smelter is putting up with in trying to abide
25 by the rules and regulations set down by not only the EPA

1 but the Air Pollution and Ecology Departments. Having
2 owned a garbage dump in Kitsap County, try as we might we
3 couldn't fulfill the rules and regulations, mostly because
4 no one in the three above-named departments knew the first
5 thing about taking care of a dump. We were finally
6 phased out after being in business for 26 years. Just
7 like the old saying which goes, "Too many cooks spoil the
8 broth." Each department has their own set of rules and
9 regulations and I defy anyone to live up to them.

10 That's it.

11 HEARING OFFICER: Thank you, (b) (6)

12 All right, I understand that (b) (6) is
13 here. It is a little before the time you are scheduled.

14 (b) (6) My name is (b) (6) and I
15 live in Sumner. I am here today because I am hopeful
16 that this hearing marks the time when the subject of
17 pollution in Tacoma is finally coming out of the closet.
18 I hope we're through pretending that it doesn't exist.
19 I hope we can encourage the EPA to help us solve the
20 pollution problem by setting and enforcing tough standards.

21 I would like to mention two aspects of the
22 pollution problem - health and prosperity.

23 As a biologist by training, I understand how
24 living cells operate. I realize that this hearing is
25 concerned only with arsenic emissions. Unfortunately, my

1 body can't always distinguish between arsenic and other
2 mutagens, carcinogens and otherwise toxic substances that
3 I encounter in my environment. Pierce County is loaded
4 with toxic substances, many of which can cause mutations,
5 birth defects and cancer. As far as my body is concerned,
6 if a molecule can cause a break in the DNA in any one of
7 my cells, then that molecule is a potential mutagen,
8 carcinogen or teratogen, regardless of whether it's
9 arsenic or benzene or what. As far as my body is concerned,
10 if a molecule can behave like that, there is no safe level
11 to which my body wants to be exposed. An additional
12 problem is that many toxic substances, including probably
13 arsenic, become more toxic when they act synergistically
14 with other substances. Consequently, the hazards we are
15 exposed to probably add up to more than the sum of the
16 individual levels of pollution.

17 For these reasons I hope the EPA will set tough
18 ambient air standards for arsenic. I suggest that more
19 than just arsenic needs to be considered and that the
20 standard needs to be adjusted downward to account for
21 exposure to other pollutants in air, drinking water,
22 food, et cetera and their possible synergistic effects.
23 And I would like you to err in the direction of safety
24 rather than risk.

25 Regarding prosperity, I have a story to tell.

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1 I was born in Pittsburgh. Pittsburgh used to be a national
2 joke. Some people think it still is but they don't know
3 what Pittsburgh used to be like! My parents have pictures
4 of Pittsburgh when the street lights had to be on at noon
5 because you couldn't see across the street through the
6 dense, black soot in the air. Most houses had marble
7 window sills, because every morning you had to scrub off
8 an eight of an inch of greasy black filth. My parents'
9 generation decided that they were sick of breathing
10 "the smell of money" and that Pittsburgh would never
11 amount to anything more than a national joke unless they
12 cleaned up their act. So they did. It took years and
13 of course it was controversial at first. They had no
14 EPA or Clean Air Act or Clean Water Act and pollution
15 control technology was primitive. But most of the people
16 in the city wanted a city they could be proud of.
17 They generated a lot of civic pride and had what they
18 called a Renaissance. They cleaned up the air; they
19 cleaned up the rivers and Pittsburgh became a city that
20 people came to live in because they wanted to live there,
21 not because they had to live there.

22 And what happened to the steel mills? Did they
23 shut down and put all those steelworkers out of work
24 because they were told to control their pollution? No.
25 They installed electrostatic precipitators in their
stacks, the pollution disappeared and they went on making

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1 steel.

2 I think I learned two valuable lessons from
3 Pittsburgh's Renaissance. First, industries are part
4 of the community. They receive benefits from the
5 community and they have a responsibility in return. It
6 is not too much to ask them to invest in that responsibility.
7 If they are not willing, then by my definition, they
8 are parasites, taking more than they are giving. At
9 that point I would say they are no longer welcome. They
10 can be replaced by other industries which do have a
11 sense of responsibility. New jobs can be created.
12 Workers can be retrained by a community that has ambition
13 and takes pride in itself.

14 Second it makes economic sense to clean up
15 pollution. What happened in Pittsburgh was truly a
16 renaissance, new industry, new buildings, new jobs, parks,
17 fountains, shopping areas, renovated landmarks, contention
18 centers, tourism. The entire city and the suburbs too were
19 enlivened.

20 This is why I believe that Tacoma is going to have
21 to face up to its pollution problems first, before we can
22 expect any wonderful transformations. We can build domes
23 and redevelop the downtown area until we're blue in the
24 face, but if nobody comes here unless they have to,
25 Tacoma will stay exactly the way it is. Like Pittsburgh,

1 Tacoma will be a national joke until we decide we'd like
2 to be proud of our city and clean it up. The economic
3 benefits that follow that kind of spirit are almost
4 automatic.

5 Let's start now. If it means shutting down
6 ASARCO, so be it. We could manage without them. We
7 could find new jobs for those lost and Tacoma would be
8 a cleaner, healthier, more prosperous place to live in.

9 Thank you.

10 HEARING OFFICER: Thank you, (b) (6).
11 Any questions from the panel?

12 (No response.)

13 HEARING OFFICER: Thank you. I'll go
14 back and check on some of the people who registered but
15 who haven't shown yet. (b) (6) ?

16 (No response.)

17 (b) (6) ?

18 (No response.)

19 (b) (6) ?

20 (b) (6) My Chairman, ladies and
21 gentlemen, my name is (b) (6). I live at
22 (b) (6), approximately (b) blocks from the
23 Tacoma smelter. I have lived there for approximately
24 57 years and during that time I have never worked a single
25 day at the smelter, although I lived there and worked

Notice: If the film image is less clear than this notice, it is due to the quality of the document being filmed.

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1 around the boundaries of the smelter all my life.

2 When I was in my teens and my 20's I worked
3 on the west side and east side of the smelter and I
4 worked there for approximately 10 or 11 years. In 1940
5 when the draft came along I picked the second highest
6 number and I served my country for approximately five
7 years, minus two months. That was the only period of
8 time that I've been away from that area.

9 I came back after the war in late October '45
10 and in '46 I got married and I went to work in July of '46
11 at the Metropolitan District at Point Defiance Park.
12 During that time we had four children, two boys and two
13 girls. They lived with us all during their growing up
14 years and they went through school, parochial school,
15 Holy Cross Catholic School which is three blocks south.

16 During that time in the late 50's and 60's
17 there was a large enrollment of kids going to school
18 there from the 1st grade to the 8th grade and I've never
19 seen anybody that had any problems with the arsenic from
20 smelter emissions. My kids went through high school and
21 graduated from the Tacoma Community College and two of
22 them went to a four year university. I worked at the
23 Metropolitan Park District for 30 years and our shops
24 and the greenhouse where I worked out of were adjacent
25 to the smelter, overlooking the smelter. I retired at

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1 the age of (b) and that was 7 years ago. I am now 73
2 and I'm kind of a little nervous because I'm not used to
3 talking.

4 HEARING OFFICER: I understand. That's
5 no problem.

6 (b) (6) : I've been in perfect health
7 all my life and I don't take any pills or medicines for
8 anything and I worked, as I said, all them years and it's
9 never affected my health, even though I never put in
10 one single day in the smelter. I am 73 years of age now
11 and I think my perfect health is due to--well, I never
12 smoked a single day in my life and I think that's one of
13 the main things that lung cancer's attributed today.
14 I think that's about all I have to say and I thank you
15 for listening.

16 HEARING OFFICER: Thank you.
17 Does the panel have any questions?

18 (No response.)

19 HEARING OFFICER: Thank you, (b) (6) .

20 (b) (6)

21 (b) (6) : This statement is being made
22 in support of the proposed standards of the Environmental
23 Protection Agency to regulate emissions of inorganic
24 arsenic at the Tacoma Smelter.

25 My name is (b) (6) . I have lived in

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1 Tacoma all of my life except for four years of military
2 service during World War II. My direct ancestry in
3 Tacoma dates back to 1887. The views expressed are those
4 of a private citizen, a homeowner, a taxpayer, an
5 independent businessman and one who is very much concerned
6 with the well being of our area and the people residing
7 here.

8 This is not submitted as being from a scientist,
9 a medical authority or one who has an in-depth economic
10 analysis regarding the smelter.

11 In my 60 plus years of growth I have witnessed
12 many changes, most of which I believe were for the better
13 regarding our style of life and the application of the
14 increased knowledge of medical and scientific data to
15 prolong our life span. To illustrate, one might look to
16 ancient people cooking with lead pots, who, unknown to
17 themselves, were committing self-destruction by lead
18 poisoning, while at the other extreme, it is not technically
19 possible to maintain life under absolutely sterile
20 conditions, thereby avoiding exposure to any currently
21 known pollutants harmful to mankind. Of course, persons
22 existing under such sterile conditions would not be
23 considered by most of us to be living a normal life.

24 It should be noted that the human body, as well
25 as most living organisms, develop and build immunities to

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1 certain adverse conditions. Thus, who is to say at
2 what level the standards should be placed to precisely
3 build the balance allowing for appropriate growth and
4 development of immunities as opposed to an overkill
5 either way. Calm, rational judgment is needed.

6 It is recognized that many opponents of the
7 proposed emissions standards are acting in good faith and
8 with full sincerity in their beliefs. However, it often
9 becomes apparent that some consider the smelter as an in-
10 animate object that may be turned off or on without concern.
11 I suggest to you that the smelter is in fact a living
12 entity composed of the people working therein, the manage-
13 ment and stockholders, and the people involved in other
14 businesses who benefit from it. I would also like to
15 suggest that as a living entity, it ought to be recognized
16 that the smelter should be entitled to certain considera-
17 tions as to its rights and entitlements. After all,
18 it was established approximately 100 years ago. It has
19 grown and changed with the times. It has been willing and
20 is now willing to change its ways commensurate with
21 existing knowledge to protect those working in the plant,
22 as well as those in the community. It should not now be
23 asked to commit economic suicide, any more than the rest
24 of us should be required to exist in the sterile
25 conditions referred to earlier. It has made, is making

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1 hopes to continue to make a substantial contribution
2 to the development and growth of this area.

3 The local management, the employees and many
4 of those of us receiving some measure of its financial
5 benefits, live in the area, raise our families in the area
6 and expect to bequeath to our grandchildren and great grand-
7 children a healthy and vibrant community. Certainly if I
8 felt a harmful situation existed, I would have long ago
9 chosen another location in which to raise my family and
10 have them raise their families. Even though I have
11 resided in the area for over 60 years, it should be pointed
12 out that the smelter was here first. It should also be
13 pointed out that many of the persons opposing the proposed
14 standards are parties who have located in the area in the
15 last 15 to 20 years or less and therefore each had the
16 opportunity to be aware of the existence of the smelter
17 prior to their settlement here.

18 In the course of my business, which is privately
19 owned and operated, but under federal government regula-
20 tion, I have the occasion to work with many government
21 agencies. Just as in all businesses, some of the personnel
22 are over zealous, some do excellent jobs and some leave
23 much to be desired. However, it has been my experience
24 that the majority are trying to do the very best job
25 possible and are trying to be fair to all concerned, are

1 trying to properly enforce rules and regulation and
2 are trying to establish guidelines to properly implement
3 the intent of Congress when it passed applicable laws.
4 The differences that come about are primarily the result
5 of individual interpretation of meanings, but on the
6 whole, rational final decisions prevail. Therefore, I
7 submit to you that the proposed EPA standards for the
8 control of inorganic emissions at ASARCO's Tacoma smelter
9 are the test of such decisions by sincere and dedicated
10 staff of the Environmental Protection Agency, based on
11 the best knowledge available to them at this time.

12 For the reasons set forth above, I request
13 adoption of such standards in the proposed form.
14 Thank you very much.

15 HEARING OFFICER: Thank you, (b) (6).

16 (Applause.)

17 Any questions for (b) (6) ?

18 MR. GAULDING: (b) (6). I don't know
19 if you attended yesterday's hearings but the agency has
20 received a number of recommendations for additional control
21 measures to be applied to the smelter. By additional
22 I mean to go beyond what the EPA originally proposed. I
23 wanted to know if you are familiar with these recommenda-
24 tions?

25 (b) (6): I am requesting the adoption

1 of the originally proposed steps, not the additional.
2 I have seen some articles in the newspaper that show
3 requests for better control and so on. I saw something
4 last night about the State last night but I think that
5 the originally proposed EPA standards should be adhered
6 to at this time. That's my request.

7 HEARING OFFICER: Any other questions?

8 (No response.)

9 HEARING OFFICER: Thank you, (b) (6).

10 Now let me go back again and see if any of the
11 earlier witnesses are here.

12 (b) (6) ?

13 (No response.)

14 (b) (6) ?

15 (No response.)

16 O.K. We are well along on our schedule.
17 The next scheduled witness is one who was originally
18 scheduled for 3:10. Let me see if that witness is here.

19 (b) (6) ?

20 (No response.)

21 (b) (6) is not here. We do have a witness
22 who has come in and requested to testify, (b) (6).

23 Is (b) (6) present? Would you come forward please.

24 I believe you just came in so I would like to state that
25 each witness gets a maximum of ten minutes and I will

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1 let you know when you have one minute left.

2 Would you please identify yourself for the
3 record?

4 (b) (6) : My name is (b) (6) .

5 I got arsenic poisoning in the state of Nevada in (b)
6 and (b) . I don't know anything about the arsenic in
7 the Tacoma smelter but I do know that any arsenic will
8 kill you and I think that they claim that three-tenths
9 of a pp could be fatal, which is very little arsenic.
10 I worked in Nevada in a gold mine where they smelted
11 and did their own ore mining gold and at times the ground
12 would be pink with arsenic and at times yellow with
13 sulfur. Everybody in the camp ate it, inhaled it and
14 drank it in their water. A dog would live there two days.
15 A cow would stray up there, get a little water, or
16 eat any food and it would die within two weeks. Every-
17 body--well the state health department came up there
18 and everybody at that time had arsenic poisoning, all
19 the kids that went to the school. Any state that would
20 work people in an environment like that is a pretty poor
21 state. My widow's kid was two months old, she had eight
22 kids and every one of them got arsenic poisoning or had
23 it. Arsenic leaves your blood and it will settle in the
24 bones and deteriorate your bones. It ruins your teeth.
25 It causes fungus that will eat your liver up and your

1 lungs and your heart and your throat and it will go up
2 through your nose to your brain.

3 It's a good 20 years since I worked in
4 Nevada and I don't figure I have much longer to live.
5 The doctor told me two weeks ago I don't have much longer
6 before me but your conditions in Tacoma, I don't know
7 how much arsenic you get. But I've got proof of
8 everything I said. Here's a book with all kinds of
9 stuff about arsenic poisoning. Here's a Smithsonian
10 Magazine that came out in April 1982 saying Napoleon
11 was killed with arsenic by his mistress sneaking very
12 little in his wine every night and over a period of years
13 it killed him. That's in the Smithsonian Magazine,
14 April issue of '82.

15 I thank you.

16 HEARING OFFICER: Thank you, (b) (6) .

17 (b) (6) : If anybody would like a
18 copy of this, they're welcome to it.

19 HEARING OFFICER: Does anyone on the panel
20 have any questions for (b) (6) ?

21 (No response.)

22 HEARING OFFICER: Thank you very much.

23 There appears to be another witness here.
24 Let's continue with our schedule of witnesses here,

25 (b) (6) ?

(No response.)

HEARING OFFICER: We'll go down to the next scheduled witness after (b) (6). (b) (6)? Maybe it is a little early for these people to be here. Let me just check. (b) (6)?

(No response.)

(b) (6)?

(No response.)

HEARING OFFICER: That takes us all the way up to 3:40. I won't call any more yet but I understand that there is another person who has come in and registered and indicated a desire to testify.

(b) (6)?

Just so you understand, each witness is limited to 10 minutes. If you take 9 minutes, I will let you know that you have one more minute left. Please approach the podium and identify yourself for the record.

(b) (6) My name is (b) (6).

I am a carpenter and I work in Tacoma during the summer. My testimony won't take probably 8 or 9 minutes. I don't really have statistics. I am not a health expert or anything else. I am very concerned about arsenic. I am very concerned about acid rain. I am concerned about pollution in general but I contribute to it every day when I drive back and forth from work. But I feel that

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1 the Environmental Protection Agency is set up to do that,
2 protect the environment and I think that if there are
3 things, health hazards that are even possibly existing,
4 if it is costing one person his or her life or the child
5 of some person their life, then I think that whatever is
6 causing that needs to be addressed. I think it needs to
7 be changed. I don't understand how we can sacrifice
8 people for that for what are supposed to be economic gains
9 in a country that is this wealthy. I don't think there's
10 any excuse for not applying that wealth, our resources,
11 everything we can to change our policies to make it
12 possible to have clean air, to have clean water for
13 people to live without fear of dying of cancer or dying
14 of some bizarre disease.

15 I know personally because my wife and my mother
16 both died of cancer. Sometimes I expect to get cancer
17 myself. I can't say that that is attributed to ASARCO, I
18 am sure it isn't. There are all kinds of things but I
19 think part of the problem is arsenic and the acid rain,
20 lead from cars - all those things need to be addressed.

21 I would like to see the EPA start doing something
22 about it.

23 HEARING OFFICER: Thank you, (b) (6) .
24 Any questions of (b) (6) ?

25 (No response.)

1 HEARING OFFICER: I will see if
2 (b) (6) has appeared?

3 (No response.)

4 HEARING OFFICER: It appears we have another
5 witness, (b) (6) would like to present some
6 testimony.

7 (b) (6), you understand the ten minute limit?

8 (b) (6): Yes.

9 HEARING OFFICER: Step up to the microphone
10 and identify yourself.

11 (b) (6): My name is (b) (6)
12 and I started at the Tacoma smelter in 1927 and I worked
13 right in the thick of it. What I mean is you've seen
14 pictures on the TV maybe but I ran one of those big cranes
15 and I worked 13½ years down there and then I left there
16 and worked at a smelter down in South America. I lived
17 around the smelter, outside of it, while I was down
18 in South America which was 8 years. I lived right close
19 to the smelter, within 7 or 8 miles. I am 74 years old
20 and actually outside of a physical examination to apply
21 for a job or something I've never been to a doctor. My
22 dad worked 42 years in the Tacoma smelter. He died on
23 the dance floor out here in Tacoma at the age of 80.
24 My brother in law has worked there 42 years. My father in
25 law worked there 44 years. A friend of mine just died the

1 other day and it wasn't through cancer but he only
2 worked there 50 years. He worked in the power house.
3 I can go on and on. These fellows lived, a lot of my
4 friends, I just saw last night in the paper, 83 years
5 old. I don't know how long you expect--I suppose if you
6 die at 83 of cancer they'd say that you got it at the
7 smelter but I think that's a pretty good age to have
8 lived to.

9 Now these fellows have come in here in the last
10 few years and they've bought a house near to the Tacoma
11 smelter, just like a fellow going out here to the airport
12 and buying a house next to the airport and then a year
13 later complaining that the darn planes are taking off
14 at McCord Field and Sea-Tac. If it's so bad as they say,
15 people tell me the grass isn't growing, how come there's
16 such a beautiful park down there, Point Defiance Park.
17 How come they put \$7.5 million into a zoo down there.
18 Didn't anybody look into it? How about the poor animals?
19 Doesn't the arsenic affect them?

20 There are a lot of these people who are
21 testifying here who live on Vashon Island. They can't
22 breathe. They have respiratory problems, no matter what
23 sickness they get, they blame it on the Tacoma smelter.
24 It seems to me that these people when they first get a
25

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1 little sickness of some kind, they should go to the
2 doctor and find out what it is. But they don't do that.
3 The first thing they do is blame it on the Tacoma smelter.

4 As far as I am concerned, they won't ever
5 rest until they get it out. I'll give you a little
6 illustration. It started before the union was strong
7 in the smelter. It used to be that if you were in a
8 job, this fellow I'm referring to was a master machinist
9 in the machine shop. You used to bring your sons in.
10 At that time you would bring your boy in and he'd work
11 for 3 or 4 months during school vacation and it was
12 quite a thrill here to get the smelter job and that's
13 where he worked every summer. I think anybody who lives
14 in Ruston knows who I am talking about. He later
15 became a pilot for United Airlines but actually he
16 worked at the Tacoma Smelter and helped to pay for his
17 education so we could get that job. Yes, he got the job
18 with United Airlines and what did he do when he had
19 accumulated enough money and stuff to buy a home, what
20 did he do, he built it right on top of the Tacoma smelter,
21 not two miles away.

22 There's just something wrong with people that
23 know or they think there's a possibility of dangers there
24 but still they'll take and build their home and families
25 right on top of the Tacoma smelter.

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1 We had another fellow here the other night
2 and that's the reason I'm down here. He was a good friend
3 of mine, (b) (6). He brought a paper down like that
4 showing you were the arsenic was. He and I went around
5 together for a long time. There's a fellow, he didn't
6 work in the smelter like I did, he went to work for the
7 state but where's the fellow living today. He had 30 or
8 40 or 50 years to move out of there if he wanted. Where is
9 he living today, half a mile from the Tacoma smelter.
10 Now these are the people that are giving all the trouble.
11 For the life of me I just can't see it.

12 I could go on and name you dozens of people
13 who are in their 80's. In the Tacoma smelter they have
14 what they call a 25 year club. In order to get into
15 that club you have to work there 25 years or more.
16 I tell you there are hundreds in there. Now you show me
17 another industry in the city of Tacoma that's got a club
18 like that, where you have to work there 25 years. I
19 don't see those fellows dying of cancer.

20 I think that's about all I have to say.

21 HEARING OFFICER: Thank you (b) (6).
22 Any questions from the panel?

23 (No response.)

24 HEARING OFFICER: O.K. Thank you very
25 much, (b) (6). Why don't we take a 15 minute break.

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1 We're way ahead of time and I am sure a lot of those
2 witnesses will be coming later. We'll be in recess for
3 about 15 minutes. We'll resume in about 20 minutes.

4 (Recess taken.)

5 HEARING OFFICER: I'm Jim Moore.

6 I am the hearing officer. We will resume. (b) (6)

7 (b) (6) ?

8 (b) (6) : My parents and myself--
9 my name is (b) (6) . I live at (b) (6)
10 which is just about (b) (6) away from the
11 smelter and my folks and myself, combined represent 165
12 years living in the same area. I used to work at the
13 smelter, for about a year, and I've been up in the arsenic
14 plant and I was a Marine in the Marine Corps and I'm still
15 in top shape. For me I feel I have had close to 100 times
16 more arsenic and sulphur dioxide going through my system
17 than anyone in the immediate area for one or two miles.
18 My father he worked in the smelter for 45 years before he
19 retired and he's in fairly good shape for 70. He's 70
20 years old, so if the children and the kids and people today
21 are worried about arsenic emissions, I say that's good.
22 They're worried about their kids and they should take
23 responsible action in taking care of their children but
24 you're also looking at almost 600 jobs down there so I feel
25 that the EPA and the smelter can work hand in hand together

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1 to put the hoods on the converters and anything else
2 and I am sure the smelter will go along with it. And
3 as far as the risk hazards, we have grown vegetables in
4 our yards for years and nobody has gotten sick or anything
5 else but even 1 part per million is dangerous. I am
6 not saying that it isn't but I just hope that a reasonable
7 agreement can be brought between the smelter and the EPA
8 because they pay salaries, they're people of Washington
9 and they're the ones that pay you. Let's just try to
10 work hand in hand together because I believe we need
11 the smelter but we don't need the arsenic emissions. I
12 think we can work hand in hand.

13 Thank you very much.

14 HEARING OFFICER: Thank you. Any questions
15 from the panel.

16 (No response.)

17 HEARING OFFICER: Thank you (b) (6).
18 The next witness will be (b) (6).

19 While you are coming up here, let me repeat for
20 those witnesses who have just shown up in the hearing room
21 that there is a 10-minute rule for presentation of your
22 testimony. We will give you after 9 minutes, I'll tell
23 you that you have one minute remaining. If you wish to
24 submit written comments other than those that you are
25 making orally today, the documents case will be open for

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1 a while, until December 10th, and you can submit
2 written statements to the EPA up until that time.

3 (b) (6), will you state your name please?

4 (b) (6): I am (b) (6).

5 I've been a resident of Ruston for approximately 40 years.
6 and have been employed by ASARCO for 17 years.

7 I decided to come here today and speak because
8 I have been very frustrated by the actions of the EPA and
9 the news media. At the outset of this we have been
10 bombarded by figures and so-called facts attesting to the
11 number of people that have died of lung cancer because of
12 the ASARCO arsenic emissions. At first the EPA stated over
13 300 tons of arsenic was being emitted from ASARCO per year
14 and an estimated 17 people per year would die of lung
15 cancer. Of course the news media had a field day.
16 Then, lo and behold, the EPA suggested that their original
17 assessment was probably, or in EPA language, they found
18 significant uncertainties, lowering the estimations to
19 less than 150 tons per year and estimating that 4 people
20 per year would die of lung cancer.

21 Now if the EPA hasn't found any more significant
22 uncertainties, the figures as of today stand at 85 tons
23 emitted and possibly 1 death per year. With this type of
24 scientific fact finding, it's no wonder everyone is
25 overly afraid and concerned. The mere mention of arsenic

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1 tends to give people an uneasy feeling.

2 As a government regulating body, the EPA should
3 have taken a bit more time and done their homework before
4 passing out erroneous information. It was a very unpro-
5 fessional move on their part. With the EPA information,
6 the newspapers and the television stations had ASARCO
7 in the linelight throughout the nation. After the initial
8 front page sensationalism produced the desired results,
9 selling more newspapers, the reporters did not take the time
10 to check if the information was true or question such
11 ambiguous data. Then all the data changed by the EPA seemed
12 to be delegated to section D or E of the newspapers, a
13 small article saying the data has changed. This to me is
14 just plain yellow journalism; that's the way I look at it.

15 Then we have some of the television news which
16 seems to have trouble getting the facts and figures
17 straight. Last night, for example KING TV, Channel 5's
18 top story quoted that it was again a choice of 575 jobs
19 and again back to 4 deaths per year from lung cancer.
20 To me the investigative journalists on the program failed
21 to do their homework. I guess I can't really fault them
22 completely as they are probably waiting for new figures
23 from the EPA. This is really surprising as Ms. Barnes,
24 Regional Director for the EPA, was the guest on this same
25 program and she never did set the record straight essentially.

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1 I have been reading a lot of prints about
2 the number of deaths supposedly caused by ASARCO's
3 emissions. If this were the case, I would believe that
4 the EPA, the scientific community or the environmentalists
5 would surely produce a list of the names of persons that
6 either died or contracted cancer from ASARCO emissions.
7 As of this date I have seen nothing conclusively stating
8 that there is an increased risk of cancer in this area.
9 As a matter of fact, of the 10 largest cities in the
10 state of Washington, Tacoma ranks 5th in the incidence of
11 cancer.

12 On Television, like KIRO, Channel 7, this
13 past Sunday they did have an editorial that stated
14 that the EPA hearings were being held in a carnival atmos-
15 phere. They said the subject was so emotional and complex
16 that it couldn't be handled by the general public as such.
17 Their solution was to get the scientific community together
18 and let them go over the facts and figures and present a
19 suggested standard to the EPA for their consideration.

20 I can see why Mr. Ruckleshaus decided on this
21 series of meetings to get the input from the local populace.
22 It gives him an out. He can always say that this is what
23 the people wanted, no matter which way his decision goes.
24 He is in essence off the hook. Finally Ron Arnold, a free-
25 lance columnist was quoted as writing the following

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1 I shall read this from his column in the Bellevue American
2 Journal: "Administrator William Ruckleshaus has a
3 pragmatic approach to policy. He openly admits that
4 his decisions are political with a small "p". Environ-
5 mentalists know that if they plaster the media with
6 false alarms, Ruckleshaus will swing their way. It
7 is public perception, not truth, that counts. The
8 EPA treatment of the truth in the ASARCO case is
9 scandalous. EPA brings the facts with the theoretical
10 model instead of scientific evidence and fills it with
11 grotesquely falsified information figures. EPA ignores
12 the evidence of a safe threshold for arsenic exposure
13 and absence of an unusual cancer rate near the smelter.
14 The media hides these facts, helping the environmental-
15 ists who could care less about the jobs of 575 people
16 who work at ASARCO or for the \$20 million payroll benefits
17 involved. We deserve better and if anyone should get
18 shut down, it is the EPA and environmental groups who
19 are waging war on the American industries."

20 (Applause.)

21 HEARING OFFICER: Any questions of

22 (b) (6) ?

23 (No response.)

24 HEARING OFFICER: O.K. Thank you,

25 (b) (6) . Now is (b) (6) here?

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1 MS. BITTALA: My name is (b) (6)
2 and I live at (b) (6) Ruston, Washington. The person
3 before me was my husband and I think he pretty much said
4 it all but I would like to kind of speak in behalf of
5 the ladies whose husbands work at the smelter, how we
6 feel and our children, especially those who live in
7 Ruston.

8 We like our community. We don't feel that we
9 are suffering. We agreed to go along with the EPA and
10 on whatever they decide because we want our lives, we
11 want our husbands to keep their jobs. A lot of our
12 husbands have been on the job a long time and this is
13 important because we established our homes in the community.
14 We established this community, its families and its
15 people who work together and play together and we want
16 to keep it that way. It means a lot to us. It especially
17 means a lot to me. I don't see why we can't come to a
18 happy medium here and do something for the good of every-
19 one, so that we can all keep our jobs and keep our health
20 too.

21 HEARING OFFICER: Thank you, (b) (6).
22 Any questions.

23 (No response.)

24 HEARING OFFICER: Thank you. (b) (6) ?

25 (b) (6) : I have been an employee of

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1 ASARCO for 14 years.

2 HEARING OFFICER: Could you state your
3 name for the record?

4 (b) (6): My name is (b) (6).

5 I have been employed by ASARCO for 14 years and the company
6 has made certain to protect employees as well as the public.
7 For instance they have an apparatus that is used for
8 testing arsenic levels. It is a battery-operated suction
9 device that simulates normal breathing. The employees
10 wear these during testing.

11 I am in good health. I have regular complete
12 physicals, as do all employees of ASARCO, by a plant
13 doctor. None of the tests have proven that there is a
14 health hazard to me.

15 Of all the people I have talked to in the Ruston
16 area, no one has ever told me that their plants or their
17 vegetables are dying or that their soil is corroded.
18 The people I have talked to in general have no objection
19 to the Tacoma Smelter operating.

20 Now you may think I am just telling you this
21 because I am an employee of ASARCO. Oh, no, if there was
22 such a great health hazard to all the people in this area,
23 do you think I would actually be working there, right
24 next to and right in the middle of an exploding bomb?
25 Oh, no, believe me, I would be the first one to move far

1 away from there.

2 A letter was witten to the editor of the Tacoma
3 News Tribune and it goes like this:

4 "To the Editor: In reference to the ASARCO debate:
5 The Tacoma smelter has been in Tacoma for many
6 decades, long before the EPA was ever in existence.
7 The community grew with its existence and never
8 worried about arsenic hazards. Now the EPA is
9 down on it. ASARCO eventually met the demands
10 within feasibility. It is still doing its utmost
11 to adhere to the EPA regulations.

12 ASARCO now relies on sophisticated equipment
13 installed and makes sure no arsenic, under its
14 control, falls on Tacoma or Ruston or Vashon Island.
15 When there is a northerly wind, it doesn't produce.
16 Southerly winds, it does produce. This does not
17 mean Vashon Island or any community is in danger of
18 arsenic.

19 ASARCO is trying to cope with EPA and has done
20 a very good job."

21 Thank you.

22 HEARING OFFICER: Thank you. Any questions
23 for (b) (6) ?

24 (No response.)

25 HEARING OFFICER: Is (b) (6) in the

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1 audience?

2 (No response.)

3 (b) (6) ?

4 (b) (6) : I am (b) (6) . I live
5 at (b) (6) in Tacoma. My primary concern is I was
6 raised in Ruston the first 18 years of my life. I
7 lived at (b) (6) and if you were to draw a
8 circle around the smoke stacks, that would probably be
9 (b) (6) and as a
10 youngster I can remember playing the the pain in my lungs
11 would be quite extensive. If we were playing baseball
12 or football or whatever it was, we would have to go
13 inside. It was not only me but the other children in the
14 area too.

15 Now we were told at the time that it was the
16 emissions from the smelter and I am under the opinion
17 that it was arsenic. However, I don't know. At the same
18 time we had a Pontiac that was a burgandy color and at
19 certain times, on nice clear days, particularly in the
20 Fall, you'd go outside and the car would be completely
21 covered with kind of a whitish-yellow powder. That was
22 explained to me that that was arsenic. It was quite a
23 corrosive material. It changed the complexion of the
24 car. In the same manner it was on some of the vegetables
25 and the other vegetation in our yard. When we called the

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1 smelter and asked them to come out and look at it, they
2 seemed to be of the opinion that it was arsenic too
3 and they subsidized my grandmother for the loss of the
4 crop.

5 Well I really don't know what the effect of
6 this is going to be on me or anybody else. But I am
7 concerned and I am very appreciative that you are here
8 and feeling out the audience. I am surprised though
9 that it is a very small audience in terms of the numbers
10 of the population and also the potential hazards of the
11 situation.

12 Thank you. Any questions?

13 (No response.)

14 HEARING OFFICER: Thank you, (b) (6).

15 Is (b) (6) present?

16 (No response.)

17 HEARING OFFICER: Are there any other
18 witnesses in the audience?

19 (b) (6).

20 (b) (6): I would just like to say a
21 few words. I worked at the smelter for 34½ years. The
22 majority of that time I was in the welding shop and I
23 welded in all departments, including arsenic. I worked
24 in all those plants. I retired in 1969 and I've been in
25 very good health. My wife and I have done a lot of

1 traveling since I retired and we've enjoyed our retirement.
2 I will say that Medicare has paid about \$250 since I
3 retired for my health. We've done a lot of traveling.
4 I guess that's about all.

5 Thank you.

6 HEARING OFFICER: Any questions?

7 (No response.)

8 HEARING OFFICER: Thank you (b) (6).

9 Is (b) (6) present?

10 (No response.)

11 HEARING OFFICER: Are there any witnesses
12 in the audience who have not registered and who would
13 like to testify at this time.

14 (No response.)

15 HEARING OFFICER: If not, we will take a
16 break for about 15 minutes. We will reconvene at 3:45.

17 (Recess taken.)

18 HEARING OFFICER: We will resume the hearing.
19 Be seated please. Is (b) (6) present?

20 HEARING OFFICER: (b) (6), you can
21 start when you are ready. Please state your name for the
22 record.

23 (b) (6): My name is (b) (6). I live
24 at (b) (6). I am director of the Environmental Law
25 Society of UPS Law School, but I am not here in that

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1 capacity. I have lived exactly (b) (6) from the
2 smelter for 30 years. My parents bought in 1950. My
3 mother died of cancer in 1972; she was 47. My father died
4 of cancer in 1976; he was 55. I live in the same house
5 with my wife and two children, ages 1 and 3. I have
6 friends and family that currently or previously have
7 worked at the smelter. Whatever the outcome of these
8 hearings, it directly affects the lives of my family.

9 First, I would congratulate ASARCO and its
10 employees for doing a good job preparing for this hearing.
11 Secondly, I could congratulate the EPA for the tremendous
12 amount of effort expended to propose regulations in 180
13 days. But, I would like to address some of the deficiencies
14 in their analyses.

15 Deficiencies, risk: Risk to this community
16 ten times the combined total risk to 14 other communities
17 that have a copper smelter.

18 After the hoods are in place, the residual risk
19 is two times the combined total risk to 14 other
20 communities that have a copper smelter before those 14
21 other smelters are required to install control devices.
22 Referring to 14 other copper smelters, "The administration
23 considered that arsenic emissions from the source category
24 and resulting exposure are significant."

25 They conclude that the residual risk hereafter

1 controls is twice as significant and therefore does not
2 provide an ample margin of safety.

3 Unwillingly this community has been for 92 years
4 and will apparently continue to subsidize a multimillion
5 dollar corporation with increased health risks. If the
6 EPA sincerely believes a subsidy for ASARCO is necessary,
7 perhaps it should consider bearing the burden, compen-
8 sation to potential victims in the community or relocation
9 of potential victims.

10 Risk is only risk from arsenic emissions, not
11 total risk to the community caused by ASARCO. Under this
12 view, we can never account for the interaction effects
13 among other carcinogens. This will not allow trade-offs
14 between carcinogens to reduce the total risk. It allows
15 fragmentation of risk. As an example if one death per
16 year is acceptable but two deaths per year are not
17 acceptable, instead of proposing an arsenic standard with
18 two deaths per year, the EPA could propose an arsenic
19 dioxide standard and a metallic arsenic standard that may
20 account for only one death per year apiece.

21 Secondly, health risk. The administration
22 considers that the application of the linear no-threshold
23 model represents a plausible uppermost estimate in the
24 sense that the risk is probably not higher than the calcula-
25 ted level, but would be much lower.

1 But they did not account for: 48 ED. Reg. S33114 (1983)
2 health effects other than lung cancer deaths, the
3 increased risk caused by interaction of arsenics with other
4 carcinogens, the increased risk caused by redistribution of
5 arsenic, the micro-meteorological effects and individual
6 susceptibility. Occupational data doesn't account for
7 children who already show much greater urinary arsenic
8 concentrations than adults. Occupational data doesn't
9 account for 24-hour exposure. Occupational data is based
10 almost exclusively on healthy adult males. Some factors
11 are difficult or impossible to measure and there are too
12 many uncertainties to assume the EPA health risk figures
13 represent the upper limit health risks.

14 Thirdly, cost. The director puts greater
15 emphasis on cost. "The EPA recognizes that the policy upon
16 which the proposed decision is based gives limited
17 weight to information on exposure and health risks in
18 determining BAT and gives substantial weight to the
19 economic feasibility of installing technologically avail-
20 able emission controls." 48 Fed. Reg. 33145 (1983)

21 The reason turnout has been relatively low at
22 public informational meetings like this is because most
23 reasonable persons perceive the EPA as ensuring that the
24 community enjoys a health environment not to ensure
25 ASARCO's healthy fourth quarter financial statement.

1 ASARCO doesn't need a large federal agency to
2 protect its financial interests. The community needs
3 adequate health protection. Costs equal costs to ASARCO,
4 according to the proposed regulation. It is inappropriate
5 not to consider increased health costs, decreased property
6 values and loss of revenue caused by ASARCO's presence
7 discouraging non-polluting industries from locating in
8 the area. These are not as easily quantifiable but no
9 less important.

10 Fourthly, the administrator considered only
11 retrofitting preexisting equipment and did not consider
12 requiring state-of-the-art technology. In fact he
13 recommended only what was already required to be installed.

14 I would like to raise these legal issues; I will
15 not make arguments. Regulations attempt to circumvent
16 112 of the Clean Air Act. Even if a work practice standard
17 is required under sub section (e) because measurement
18 methodology is not practical, the work practice must relate
19 to an emission standard.

20 11.6 mg/C³ of particles specifically designed to
21 allow various arsenic emission rates depending on ore
22 concentrations. Total particulate emission from primary
23 copper smelter operations remain relatively constant
24 regardless of the inorganic arsenic control of the ore.
25 Nothing in the proposed regulations prevents ASARCO from

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1 refining 100 percent high arsenic ore and emitting more
2 arsenic than they presently do. There is also the
3 constitutional question of whether the arbitrary distinction
4 between high and low arsenic smelters, which singled
5 out Tacoma ASARCO for special treatment denied the
6 community equal protection when the residual exposure here
7 is five times the combined risk to the 14 other smelter
8 communities.

9 I question the statement made near the end of
10 the regulations under miscellaneous: "Emission limits
11 apply at all times except during periods of startup,
12 shutdown and malfunction." The purpose of an emission
13 standard is to encourage compliance not to provide means
14 and incentives for circumvention.

15 Then there is monitoring and enforcement. I
16 question whether the EPA can enforce regulations. Perhaps it
17 is too easy to circumvent 11.6 mg/dscm concentration
18 standard just by increasing the rate of air flow across
19 the air curtain. Even specifying a monitoring location
20 as suggested in the regulations would not solve the
21 problem.

22 Ironically increasing the air flow may actually
23 capture more particulate matter but reduce the measured
24 concentrations. Some doubt whether the EPA can enforce
25 the current regulations.

1 In the past seven years neighbors and I have
2 been getting severe particulate fallout, most noticeable
3 from Spring until Fall. Primarily it happens at night.
4 Occasionally on weekends and evenings but rarely during
5 the day. Opacity checks by PSAPCA are made during weekdays
6 and only occasionally in the evening.

7 (Slide shown)

8 First when I brought this to the EPA's
9 attention, specifically to Robert Ajax, I was surprised
10 to learn that he was unaware of the problem. I started
11 to collect daily emissions on a 18 by 19 sheet of paper
12 which I have here and I offer in evidence.

13 On one occasion, my wife noticed at 4:00 a.m.
14 that the smelter was again emitting heavy black smoke.
15 The next day our cars were covered with black spots. An
16 ASARCO representative came to inspect and he took a
17 sample test to see whether it came from ASARCO. I asked
18 him to call us with the results of the test. I had to
19 call him a week later and he told me that the sample did
20 not come from the smelter. You can't live here 30 years
21 and not recognize the distinctive deep purple, almost
22 black color, granular texture and unique characteristics
23 of smelter fallout. I was and am sure it was from the
24 smelter but when I called EPA and PSAPCA, they told me
25 they did not have the facilities to make a similar test.

1 ASARCO has greater incentive to mislead, deceive
2 or lie to the EPA than they do to me. Interestingly,
3 on the night of October 2, 1983, a few days after the
4 EPA's supervised monitoring ceased, we had the worst fall-
5 out of the year..

6 I want to address briefly the arguments ASARCO
7 makes. ASARCO and the EPA stress the importance of
8 arsenic production. ASARCO is a copper refining facility
9 and I think it is particularly inappropriate for the EPA to
10 protect profitability of by-product production. There may
11 be less hazardous ways and locations to produce arsenic
12 than by smelting high-arsenic ore in a residential
13 community. If the EPA is worried that limiting or elimina-
14 ting refinement of high-arsenic ore would increase U.S.
15 dependence on foreign supplies, the U.S. is already
16 dependent on foreign supplies of high-arsenic ore.

17 On the zero threshold issue, if ASARCO claims
18 a zero threshold, which is contrary to the position of
19 the National Academy of Sciences, what is that level and
20 with what degree of certainty can one establish that level?

21 Lastly I would recommend reduction of the risk
22 in this order of preference: the zero risk option,
23 impose no greater risk than imposed on 14 other
24 copper smelting communities, restrict arsenic emissions
25 to a level no greater than that emitted by the 14 other

1 domestic copper smelters and apply the standard at all
2 times. Require state-of-the-art technology at ASARCO and
3 consider costs to the community when developing the
4 best available technology.

5 As regards monitoring, the EPA should have the
6 means to directly monitor stack emissions. Stack emissions
7 may be much greater than EPA estimates and may be much
8 greater than fugitive emission. Emissions photographed
9 and samples collected indicate the particles are not first
10 passed through any collection device and are dispersed
11 over a relatively small area. The means of collection
12 should not depend on ASARCO and monitoring should take
13 place 24 hours a day.

14 Thank you.

15 HEARING OFFICER: Any questions of (b) (6) e?

16 MR. SALO: You suggested that high arsenic
17 and low arsenic smelters be given equal protection? Would
18 you elaborate on that?

19 (b) (6) Well, as far as I see it,
20 there is a distinction between the high arsenic and low
21 arsenic smelters at .7 and I don't see any rational
22 basis for making that distinction. This community is not
23 protected as well as other communities. That's why I
24 raised the issue of protection.

25 HEARING OFFICER: Any other questions?

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(No response.)

HEARING OFFICER: Thank you (b) (6).

(Applause.)

HEARING OFFICER: (b) (6).

(b) (6): My name is (b) (6).

I was born in the city of Tacoma 77 years ago. I attended what is now the University of Puget Sound, College of Puget Sound when it's campus was where the adjacent high school is and at that time directly across from the college was Nalley's first plant. So I am considered sort of an oldtimer around the city of Tacoma.

I have no connections at all, in any way, shape or form with the smelter. I do not even know the manager of the smelter. At one time I probably could say that I knew at least one out of every three people that worked in the smelter. That isn't the truth at the present time.

Now for 26 years I've lived in the shadow of the smelter. I raised a family of five. They and their families, which total approximately 38 people at the present time all living in the immediate vicinity of the Tacoma smelter. I am talking for the Tacoma smelter merely as a citizen who wants to see the right thing done and that's it. The only one in my family who actually worked at the smelter was my father. He worked

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1 there and lived to a ripe old age of 89. None of the
2 38 people I have who have lived in that area died of
3 cancer or had anything to do with cancer. Also in the
4 immediate vicinity, that was almost like a Who's Who
5 of Tacoma, I could name numerous people that lived there
6 and some of the oldtimers you'd know, (b) (6) for
7 instance, he lived there in the vicinity and (b) (6)
8 lived there in the vicinity. (b) (6) who had (b) (6)
9 kidnapped lived in the vicinity. (b) (6) lived in
10 the vicinity. (b) (6) lived in the vicinity and none
11 of them have died of cancer or had anything to do with
12 cancer. Now one of the things I have to mention is
13 that (b) (6), who just recently talked at Pacific
14 Lutheran University, he is an EPA expert and he praises
15 the new chief we have now, William Ruckleshaus and we all
16 hope that William Ruckleshaus will bring some sense out
17 of the chaos caused by three years of destructive efforts
18 of (b) (6).

19 Now I consider the smelter to be a very good
20 neighbor. Even the Russians know of the Tacoma smelter.
21 It sounds kind of funny but I had a drink of Scotch whiskey
22 with an English captain on an English boat that brought
23 Russian ore from Odessa from the Black Sea to the Tacoma
24 smelter because it is the only smelter in the world
25 that could pick the gold out of this amalgum that they

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1 have. There were several loads but that was one of
2 them.

3 I am here in defense of the Tacoma smelter.
4 I am sick and tired of the ecologists and environmental-
5 ists and the EPA. I have known professors who publically
6 start crying about the monstrous ASARCO, the Tacoma
7 smelter. For instance, in a manner of example, I
8 understand we have against the smelter the Audubon Society,
9 the Sierra Club, the Department of Ecology, the Department
10 of Social and Health Services, the Puget Sound Air
11 Pollution Control Agency and the University of Washington
12 School of Public Health. Now the companies that they are
13 all fighting against are the mainstay in the city of
14 Tacoma.. St. Regis, who I work for, Occidental Chemical,
15 Penwalt, Reico Chemical, Tacoma Landfill, Fairchild Instrument
16 Company; they started picking on them before they finished
17 their plant, and the Hooker Chemical Company and ASARCO
18 smelter.

19 For ten years I lived right above Hooker Chemical.
20 It wasn't even mentioned in most of their books here and
21 every once in awhile they would have a spill of chlorine
22 which is far more deadly than the arsenic that the smelter
23 puts out. Anybody can have an accident. Sometimes I
24 almost think that some of the groups that try to get rid
25 of our companies here, I hate to say this, but I sometimes

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1 think that they might be almost communistic inspired.

2 Now for 25 years I've lived in the shadow of
3 the smelter and raised my family of five, as I just said.
4 All that time the smelter management has always been
5 sympathetic to the welfare of its neighbors, starting
6 way back when they had the small stack, which is still
7 up there, the square stack which is still out there,
8 and they built the 600-foot stack which I was very proud
9 of because at that time it was the highest stack in the
10 world.

11 All right, since that time they have done every-
12 thing else. They had their own weather department there.
13 They could tell tomorrow way back when which way the
14 wind was blowing and the density of it and whether it
15 was raining or whatnot. They've always been instrumental
16 in cutting down high output during the time we had
17 inversion in the air.

18 After they built the tall stack, the next thing
19 they did was to eliminate, something that was just mentioned,
20 eliminate the dust particles in the smoke. They put in a
21 precipitator there. Now I doubt if very few people who
22 are squacking against it even know what a precipitator is.
23 It was one of the first ones installed anywhere and it is
24 a hugh high voltage electric spark that is in the bottom
25 of the stack and that precipitates all the particles which

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1 go out and drop down to the bottom of the stack.
2 Now part of that is where they get the valuable ores,
3 platinum, gold and whatnot because they take that and
4 shovel that into carts while it is still hot and take it
5 up to what they call the battery room. Now as a matter of
6 example, there's a man that I know who worked there for
7 30 years. He was never sick hardly a day in his life.
8 After he quit he became sick. He went to the doctor and
9 found out that he was short of arsenic, so the doctor
10 prescribed arsenic for him, a small amount to make him
11 well and he lived then to a ripe old age. So arsenic isn't
12 as bad as what some of the people try to claim.

13 I had an aunt, for instance, this was back
14 before the day of Primateem and this aunt had asthma and
15 so the doctor prescribed arsenic. She got so that she
16 was immune to arsenic and she would take a spoonful of
17 arsenic like I would use sugar and take a spoonful of
18 arsenic. The doctors claimed that a drop of her blood
19 would kill a rat. Now whether that's true or not I can't
20 say but she lived to be 85. She took arsenic for at least
21 half her lifetime.

22 In regards to this precipitator, in 1978 they
23 improved the precipitator and put new bag houses on the
24 roasters in the arsenic plant and annode emission control
25 system to reduce the emissions. Everytime they find

1 something that is new, they install it. They try to do
2 the right thing as far as I am concerned.

3 Now, you say, how do I know all of these things,
4 I have been through the smelter numerous times. If I
5 had a chance, I'd go through it again tomorrow. It is
6 very interesting, even down to the place where you can
7 stand and see huge bricks of gold that they bring out
8 of this ore that no other smelter can do.

9 I wrote several letters which were published in
10 the News Tribune and some of them, one in particular,
11 was pooh-poohed and some of the people thought that I
12 was being very facetious. I was not. I would like to
13 read the letter that I wrote to the editor:

14 "While some of us are elated with the progress in
15 Tacoma with the new dome, the new downtown YMCA,
16 the new hotel and increased business in the Port,
17 others who are misguided and improperly informed
18 are trying to drive out some of our best employers
19 including the ASARCO, St. Regis, Occidental, Pennwalt
20 Tacoma Landfills, Fairchild Instrument Corporation,
21 the last being condemned before it actually began.
22 This group calls itself Tahomans for a Healthy
23 Environment and they have all the answers. If they
24 don't like it, get rid of it; never mind the conse-
25 quences to the people out of work. Send the

1 business to Japan, they say.

2 They say ASARCO in 1980 put out emissions of
3 96,000 tons of sulfur dioxide, 400 tons and one ounce
4 of arsenic dioxide and they must know. In one
5 issue of Epilogue, the official publication of the
6 EPA, it was reported that 10 cows burped enough
7 gas in a year to provide for the space, water,
8 heating and cooking requirements for a small house.
9 Then would it be fair for anyone to say that cows
10 must rank as the number one source of all air
11 pollution in the United States. The magazine reported
12 that American cows burped 50 million tons of hydro-
13 carbons and there exists no available technology
14 to control the hydrocarbon emissions. So no doubt
15 they will tell us we have something else to worry
16 about so let's kill the cows."

17 I want to go on further to say that although
18 scientists have discovered natural cancer causers in
19 fact in food, Dr. Ames, and he's the Chairman of the
20 Department of Biochemistry, University of California,
21 says, "Fats present in such things a meat and buttermilk
22 may be the top cause because they can break down chemically
23 in the body to create free radical electrons that are
24 then loose and can change chemical action of the cell.
25 Varieties of vegetables that contain natural pesticides

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1 made by plants to protect against insects, fungus and
2 animals are one of the things that cause cancer. Burned
3 and brown foods, including everything from carmelized
4 sugar to toast, certainly have a large variety of DNA
5 damaging agents. I might say further that substances that
6 appear to have anti-cancer effects include Vitamin C,
7 Vitamin E, rare metallic minerals like Selenium.

8 I can find a lot of articles that are on either side
9 of the fence, all of them from chemists who should know
10 something. Now a lot of times we hear from people who
11 don't actually know what they're talking about. It's
12 like Dick said about the EPA. He said the EPA are using
13 scare tactics and that's why the people on Vashon Island
14 think that they're all going to die over there from the
15 smelter.

16 HEARING OFFICER: Your time is up. If you
17 wish to put some more comments into the record, you have
18 until December 10th to do that.

19 (b) (6): Well, thanks a lot. I would be
20 very happy to answer any questions that I could.

21 HEARING OFFICER: Any questions for (b) (6) ?

22 (No response.)

23 HEARING OFFICER: Thank you, sir.

24 (b) (6) ?

25 (b) (6): My name is (b) (6). I

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1 live in University Place here in Tacoma. I was separated
2 from the Service back in 1946 and I enrolled at the
3 College of Puget Sound in September of that year. In
4 the Summer of 1947 I got a job at the Tacoma smelter
5 during the Summer and I worked there as a common laborer
6 emptying ore sacks. When school resumed again in
7 September '47 I tried to get a swing shift job so I could
8 continue to work. The only one I could get was one in
9 the arsenic department. Not knowing anything about
10 arsenic, I just took the job. The company provided you
11 with a pair of coveralls, a hard hat, gauze bandages to
12 put around your collar, shoes, gloves and underwear and
13 the job was from 3:00 in the afternoon to 11:00 at night,
14 a half hour for lunch and a half hour for clean-up time
15 at 10:30.

16 My job was scraping arsenic powder out of the
17 retorts where it was precipitated. I would pull it towards
18 me with a long rod that had a flat bar of metal at the end.
19 I scraped this powder towards me onto a conveyor belt.
20 It was taken to a big hopper and from there it was loaded
21 in new sacks and barrels. I worked there from September
22 until about December. With the workload at school and
23 working swing shift, I had five days at school and five
24 days swing shift, my days off was for doing homework and I
25 just kept falling behind in math, chemistry and physics

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1 til I had to quit. I worked down there three months.
2 During that time I did have a problem in my nostrils. It
3 seems like arsenic powder caused inflammation in the septum
4 and eventually it did pierce the septum. That's what
5 it's called, a pierced septum. It is a hole in the
6 septum between the two nostrils. Outside of that I had
7 no ill effects. This was back in 1947. Since then I
8 finished my career at the College of Puget Sound which
9 is now the University of Puget Sound. I worked up in
10 Alaska as an accountant and I worked for the State of
11 Washington in Olympia in the Utilities and Transportation
12 Commission as staff accountant for over 25 years. I
13 retired about 5½ years ago and I am still living here
14 in the Tacoma area and I like it fine.

15 I have known other people who worked at the
16 smelter. There's one man, we call him (b) (6),
17 and (b) (6). They both worked in the coal flats
18 for more than 30 years. (b) (6) passed away a few
19 years ago with a heart attack at the age of 78. (b) (6)
20 was also over 80 when he passes away with a heart
21 attack. No one of I know of who worked at that smelter,
22 there were some other students who got part-time jobs,
23 none of them that I know of had any ill effects from
24 working at the smelter. So as close as I was to it--
25 I know when we had a smoke break, a ten minute break to

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1 go out in the fresh air and smoke a cigarette, the
2 cigarette tasted sweet, I couldn't even enjoy them because
3 of the arsenic powder that permeated everything, your
4 hair, your hands, and your pockets. Even taking a shower,
5 which they provided you, and you got clean clothes when
6 you came back the next day on shift, but I dare say that
7 in one week I breathed, inhaled and ingested more
8 arsenic powder than local residents would in 50 years
9 and I can say that there have been no ill effects to me.

10 So I feel it is my duty to come here and tell
11 you people what I think about closing or placing strong
12 restrictions on the smelter. I don't believe that's fair
13 to the operation of the smelter. It is almost akin to
14 someone buying some property near an airport and then a
15 couple of years later saying that the noise is causing
16 them ill health so we should close down the airport.
17 I don't think it's right. The smelter was here for many,
18 many years and I've only been living here since 46 in
19 Tacoma but I don't know of reading any articles about
20 people contracting any cancer from arsenic or related to
21 working in the smelter. So I feel it is my duty to come
22 here and let you people know how I feel about this and I
23 feel perhaps I am an example of someone who has been
24 in and around the arsenic and still don't feel any ill
25 effects. Maybe it will affect me later. Thank you.

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1 Are there any questions?

2 (No response.)

3 HEARING OFFICER: Thank you, (b) (6)

4 (b) (6) ?

5 (b) (6) : My name is (b) (6) and
6 I work for ASARCO Tacoma. I have been there for 19½ years
7 and I've also been a resident of Tacoma for 19½ years.

8 I was born and raised in Minnesota. I lived
9 on a farm and half of the years before I came out to
10 Washington I also worked in the industrial area of St. Paul-
11 Minneapolis for approximately half that time. During the
12 Spring, after the rains had come and things had thawed
13 out, we seeded the ground and we created some dust. It
14 depends on how big of a farm that you have. If you have
15 a large amount of land and you grow a lot of crops, you
16 raise a lot of dust. In that dust there's a certain
17 amount of arsenic. Every farmer and everybody that I
18 worked around when I was a youngster and when I was
19 younger, they made the most of it. They wore a handkerchief
20 around their face. You still got some of the dust in.
21 To the best of my knowledge when I was around there,
22 nobody ever contracted cancer from arsenic and there was
23 a lot of arsenic in the ground. You have to have arsenic.
24 It's been proven that you have to have it for medicine.
25 You have to have it in the ground to take and grow the

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1 grain. It's a way of life.

2 When I worked down at the smelter down there
3 there's a couple of different ways you can do it and I
4 did it for many years without the EPA telling me that
5 I had to wear a respirator. I now wear a respirator but
6 I didn't for many years. I put one on myself when my
7 common sense told me, "Fella, you need a respirator" and
8 I put one on. There were other times that I didn't wear
9 a respirator and I was not afraid of my health and other
10 people working around me didn't wear a respirator, but
11 that was a personal choice. Today we don't have a
12 personal choice no more, whether to wear a respirator or
13 not to wear a respirator because the EPA says to the
14 Tacoma smelter, "You tell your fellows to wear that
15 equipment down there or else we're going to give you a
16 fine." so the smelter in turn tells us, "Fella, if we
17 get a fine, you'll be in trouble." so everybody knows
18 that knows me from the smelter down there, I don't have
19 any trouble down there. I wear a respirator because
20 there's a good reason for it. I wear glasses, I wear
21 bifocals. I also come down with colds or flu sometimes.
22 A lot of times I can't afford to stay home maybe like
23 somebody else did because they've got sick leave. I
24 imagine every one of you fellows on that panel have got
25 sick leave from the government. We don't have that at

1 the smelter so we have to come to work there a lot of
2 times when we have colds or flu. When you go and put
3 a respirator on, you restrict your air to begin with and
4 when you have a cold or the flu, you make it even worse.
5 So there are times even now with the regulations that I
6 take my respirator off for those two reasons. Now as to
7 how much damage it is going to cause persons who take and
8 breathe this arsenic, it hasn't caused me any damage in
9 19½ years.

10 I am a smoker and it says on a pack of
11 cigarettes the Surgeon General has determined that
12 smoking cigarettes is pretty dangerous to my health.
13 Now I don't consider working at ASARCO being a dangerous
14 occupation. I never have. If I came to the conclusion
15 it was dangerous, I wouldn't work there. I have a high
16 school education and I have a lot of common sense and
17 I didn't arrive at common sense just from getting a little
18 bit older. There's a lot of experience involved in that.

19 I realize I only have ten minutes, but getting
20 back to arsenic, how many times has the EPA tried to
21 regulate something, an industry, where a lot of times they
22 didn't know the facts and they didn't know everything about
23 it? So here they are in Tacoma right now and they're
24 going to take and try to regulate the standard at the
25 Tacoma smelter about arsenic. We have seen groups in this

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1 town, small groups, minority groups I've seen them bloom
2 and blossom but I have seen them all of a sudden jump in
3 with both feet and now that they realize that they're into
4 it, they say, "Hey, maybe I'd better take one of these
5 feet back out of here because I really don't know what's
6 going on here."

7 It's pretty complicated. I've got a button on
8 here that says, "Both". I want to look out for myself,
9 my wife and my children, our health, but I also want a
10 job and I want to continue to live in this area. I know
11 the beauty of it. I don't think it's fair, the kind of
12 standards you're trying to make ASARCO live up to. You
13 don't even have the technology, nobody's got the technology
14 for it, to set a standard. I don't know how anybody can
15 use their common sense and make a set of standards like
16 you're proposing. It just doesn't make sense.

17 I think all three parties, I think the health,
18 everybody for resources who testified here, for health
19 reasons, for jobs, the EPA, I think everybody could take
20 and work together. Let's develop some technology. Let's
21 go out and look for it. We've got all kinds of learned
22 people. Let's go out and search for it. I believe with
23 everybody working together, they could come to some kind
24 of a solution rather than closing down the smelter. I
25 don't think that's a solution.

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1 We've heard differing testimony about health
2 reasons, arsenic, you've heard doctors on one side
3 that it doesn't cause cancer and I've heard others
4 testify and say it does. I heard the American Lung
5 Association say a lot of things too, that cigarette
6 smoking can cause you cancer, maybe, but that's a big maybe
7 and nobody knows for sure.

8 I just don't think you can put down a regulation
9 on anybody if you don't know for sure what it's going to do.
10 That's about all I have to say. If anybody has any
11 questions, I'd be glad to answer them.

12 (No response.)

13 HEARING OFFICER: Thank you, (b) (6).

14 HEARING OFFICER: Is (b) (6) present
15 in the room? (b) (6), is (b) (6) present?

16 (No response.)

17 Is there anyone else who would like to talk
18 to the subject?

19 (No response.)

20 I see no response. The record should reflect
21 it is 4:30. The last witness for this afternoon's session
22 was scheduled to (b) (6) and he has testified. If no
23 one else wants to testify, we will adjourn for dinner
24 and reconvene here at 6:30 this evening.

25 (Hearing adjourned at 4:30 p.m.)

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EVENING SESSION

(6:30 p.m.)

HEARING OFFICER: The hearing will come to order. We have reconvened the evening session of November 3, 1983 of the Arsenic Standards Hearing.

For those who have not attended the hearings, I would like to do a couple of things. First I would like the members of the panel to introduce themselves for the record and indicate what their position is with the EPA.

MR. O'NEAL: My name is Gary O'Neal and I am Director of the Environmental Services Division.

MR. SALO: I am Earl Salo, Attorney from the Office of General Counsel, Washington, D.C.

MS. DAROH: My name is Dana Daroh, Departmental Health Specialist, Regional Office, Seattle.

MR. O'CONNOR: I am John O'Connor of the Economic Analysis Branch..

HEARING OFFICER: I am Jim Moore, the hearings officer. With respect to the rules for testifying, the time limit for all remarks is 10 minutes. When you have testified for nine minutes, the Hearings Officer will notify you that you have one minute left. Whether you testify or not, you can submit written material for the record and you can do so until December 10, 1983.

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1 You can either submit those materials at the hearing
2 or if you do not have them ready now, you can mail them
3 to the EPA in Seattle. The EPA personnel at the registra-
4 tion desk in the rotunda back in the hall will be able
5 to give you the address for such information.

6 Any visual materials that you use, such as
7 slides, must be submitted for the record in hard copy.
8 When you testify, since a record is being made by a
9 court reporter, please come up to the podium and speak
10 into the microphone so your testimony is audible to
11 everyone here and specifically the court reporter.

12 I'm going to begin calling the first witnesses
13 who have registered for this evening. The first one
14 registered this evening is (b) (6). Is (b) (6)
15 present?

16 (No response.)

17 The second one registered is (b) (6). Is
18 (b) (6) present?

19 (HEARING OFFICER: Please identify yourself
20 for the record.

21 (b) (6): My name is (b) (6). I am
22 professor of economics at the University of Puget Sound
23 and I appreciate your willingness to let me speak this
24 evening and offer a few comments.

25 My testimony will not relate directly to the

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1 arsenic level and the ambient air quality issue, rather
2 what I would like to do is to stress or point out to you
3 three issues that I think relate to the impact of what
4 happens when environmental quality issues are raised in
5 a community and the quality of live in a community is
6 adjusted either upward or downward and what I would like
7 to suggest is that what I have heard or read in the paper
8 have not dealt much with economic impacts.

9 There are some definite economic impacts. There
10 are certainly numerous academic studies to prove that.
11 Alterations in standards, quality of life and other
12 rhetoric issues do make substantial differences in
13 a community in terms of economic activity.
14 Unfortunately it is often focused on the fact that those
15 are only always adverse economic effects, economics,
16 unemployment, loss of jobs and industry leaving. There
17 is a great deal of evidence however to suggest that there
18 are also some positive economic effects that take place,
19 particularly when regulation occurs and improves the
20 economic environment and the quality of life in the area.

21 What I would like to do this evening, in a
22 few brief minutes, is to point those out to you so that
23 you're aware of some positive benefits, some positive
24 effects and you can decide how to balance those against
25 the adverse effects that will occur, for certainly there

1 will be adverse effects. If arsenic levels are reduced
2 and in general the environmental quality improves,
3 through increasing the costs of producing goods and services
4 in the local community. There will be unemployment, there
5 will be loss of jobs and there will be less income.
6 But I think it is important to realize that there is the
7 other side to that equation. One other side, which
8 economists have been very actively discussing, is that
9 when the environmental quality of an area improves,
10 people in that area who remain tend to be better off
11 and in fact they are implicitly willing to make payments
12 to become better off. That is by studying different
13 communities that have different qualities of environments,
14 we studied the wages and how they differed in making
15 other adjustments as appropriate. It has become reasonably
16 clear within the economic profession that people are willing
17 to work for lower wages when the quality of life is
18 better and implicitly that means people are willing to
19 accept some trade-off between the quality of the
20 environment and the level of economic activity.

21 There have been numerous studies that have
22 come out recently, I would like to point that out. One
23 recent study shows that as an average in the United States
24 that implicitly people are willing to pay about \$2 for
25 every part per million of suspended particulates that are

1 taken out of the air. If we then multiply that by say
2 400,000 people in the county, on an average, if it would
3 be worth \$2 as it is in the rest of the country, then
4 you're talking about \$800,000 in benefits, irregardless
5 of any health improvements for quality of life adjustments
6 otherwise to be recognized.

7 So, I think it is important to realize that
8 there may be some positive economic value that people
9 get from improvement in the quality of life, even though
10 some people will be made worse off. Many people will be
11 made better off.

12 The second thing I would like to point out is,
13 one of the important issues that comes up is the un-
14 employment issue and one often hears that if the smelter
15 closes or if in fact any firm closes, then X number of
16 people will be unemployed and that is true. If the
17 smelter were to close, there would be no work and many
18 people would become unemployed. But it is often suggested
19 or at least implied that a lot of those people would be
20 permanently or forever unemployed and burdens on the
21 local community. Of course, that is simply not the case.
22 In 1982 for example the average duration of unemployment
23 was only 15 to 16 weeks. Most people who are unemployed
24 eventually find alternative jobs or withdraw from the
25 labor force and take some form of early retirement or

1 otherwise are able to not become burdens on the
2 community. They may move to other communities or take
3 alternative forms of employment. I think it is entirely
4 misleading to think that X number of people will be
5 unemployed and that they will be forever unemployed.
6 In fact, that is definitely not the case. It would be
7 an extremely rare outcome if that were to happen.

8 Thirdly I would point out that as the environ-
9 mental quality of the area improves, the area itself
10 becomes more attractive to new forms of employment. I
11 was engaged this past Summer in an extensive summary of
12 Pierce County in terms of its economic liabilities and
13 its economic assets. One of the conclusions by colleague
14 and myself came to was one of the most important assets
15 that Pierce County has, in terms of attracting industry,
16 is the quality of its life and the quality of its
17 environment. Again to a large extent we found individuals
18 who were active in industrial relocation work said that
19 until the quality of Pierce County's environment,
20 including its land-use regulations and the ASARCO issue
21 and the smell and everything else improves, that many
22 firms, which may have been very attractive to most of us,
23 would chose not to locate here but they moved to somewhere
24 else, to Arizona, New Mexico, Colorado, or other areas of
25 the Pacific Northwest.

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1 I would suggest that as the quality of the
2 environment is improved, we will increasingly see other
3 firms willing to come in and replace those jobs that
4 were lost, so it is not fair at all if you just look at
5 the unemployment issue to say that cleaning up the
6 environment would produce a net effect of less jobs.
7 It would result in temporary problems but my suspicion
8 is that certainly those results would be mitigated and
9 the degree of mitigation would depend on how fast the
10 new jobs come in and what decisions are made by those
11 unemployed individuals. There will be benefits that
12 everyone will get from the improved quality of the
13 environment.

14 Thank you very much.

15 HEARING OFFICER: Thank you, (b) (6).
16 Any questions?

17 MR. O'CONNOR: Would it be possible to
18 see copies of the studies you reviewed?

19 (b) (6): One study just came out last
20 year but I would be happy to provide that to you.

21 MR. O'CONNOR: Would you submit it for
22 the record then?

23 HEARING OFFICER: We will be at the new
24 address, 17th Street.

25 (b) (6): I'll try and get you a copy.

1 HEARING OFFICER: The hearing is probably
2 just going to be in the morning tomorrow. I am not sure
3 but the way things are scheduled now, it may just be in
4 the morning. Otherwise you can get the address and
5 submit it, the address is at the registration desk.
6 (b) (6): Any more questions.
7 (No response.)
8 (b) (6): Thank you.
9 HEARING OFFICER: Is (b) (6)
10 here yet?
11 (No response.)
12 HEARING OFFICER: (b) (6) (b) (6) ?
13 O.K. I don't know if you were here when we
14 were discussing the rules but you get no more than 10
15 minutes.
16 MR. GRUNBERG: My name is Leon Grunberg.
17 I was supposed to speak yesterday but I switched with
18 (b) (6). I don't think he came but I took his spot.
19 My name is (b) (6) and I am professor
20 at University of Puget Sound in Industrial Sociology.
21 I am going to discuss the issue of affordability in
22 general and my relative expertise is on the study of the
23 reasons for and the consequences of plant closure by multi-
24 national companies.
25 I've written a book on that and I've read quite

1 widely in the rather limited literature on the subject
2 of closures. In particular I studies several cases in
3 depth over a two-year period of the economic justifica-
4 tion for closure of companies. Based on that work, I would
5 like to raise some important general issues because I
6 think the EPA has done an impact study but it is about
7 2½ inches thick and they only got it two days ago and
8 I just didn't have the time to go through it in detail.
9 So I would just like to raise some important issues
10 regarding the affordability or the costs.

11 Before I do, let me just preface my remarks
12 by saying I am very aware of the costs associated with
13 closure from my study and I realize that they can be very
14 damaging to the workers in the community concerned. That
15 is of course one of the strong points in my book.
16 Nevertheless, my central point today is that it is
17 difficult to accurately assess the economic performance
18 of the plants and subsidiaries that are part of a large
19 multi-unit, multi-national company. The reasons for
20 this include, and I think this may be the most sufficient
21 reason, that the accounting practices employed can alter
22 profit-loss figures of the plant or the subsidiary.

23 For example, ASARCO may decide to allocate
24 higher over-head costs to Tacoma than are warranted or
25 it may charge higher service charges for internal services

1 provided to the subsidiary or it may charge higher prices
2 for the goods that are moved within the company from one
3 plant to another. It may do this for several reasons.
4 It may do it for tax purposes, to minimize taxes in one
5 locality. The evidence is clear that internationally
6 anyway, most multi-national companies engage in this
7 practice regularly, although it is hard to prove.
8 Secondly, they may do this because it sees the plant as a
9 cash cow, as it's called in management terms, which is
10 the plant is seen as facing a declining market with a
11 poor future and therefore it is gradually phased out,
12 so the money is milked from that plant and used for invest-
13 ments in other more-promising plants. I've heard rumors
14 about this at ASARCO but I am not going to make any state-
15 ments on that because it is just rumors.

16 Thirdly it could be to undermine union wage
17 claims by showing an inability to afford higher wages at
18 the plant, especially a plant that has a strong work
19 force or, perhaps more relevantly, an inability to
20 afford necessary pollution controls. Indeed a declaration
21 by regulatory agencies that affordability be a key
22 criteria in proposing standards may actually be an
23 incentive for companies to inflate costs and deflate
24 revenues at a particular plant to show that minimum
25 controls are the only things that are affordable.

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1 I don't know of any evidence of that particular
2 last point at ASARCO that I can point to because I don't
3 know that and it seems like the evidence in this issue is
4 a new issue but there is a lot of evidence of the first
5 three points. These accounting practices may operate
6 to reduce profits at a certain plant.

7 My second point is that it is vital to
8 understand that large, complex, multi-unit companies
9 tend to have very centralized decision making that they
10 tend to have strategic plans which outline the overall
11 direction of the company in the long-term and they also
12 outline the role and place of each part of the company
13 in that plan. Maybe the study that was done by Arthur Little
14 I did not see any evidence that they had taken into account
15 strategic plans at ASARCO. Often according to that plan
16 subsidiaries or plants may be favored or starved of
17 investment resources, new products, even export markets;
18 they may be allocated export markets according to some
19 decision in the headquarters and that is something that I
20 go into in my book, not according to any rational financial
21 calculations but based on that plan of the subsidiary's
22 performance but according to the requirements of the
23 strategic plan which has as its primary goal the maximization
24 of total company profits and not that of any particular
25 plant or each plant for that matter.

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1 There EPA should try to obtain access to the
2 company's strategic plans either through an interview
3 or through actual looking at them as well as financial
4 data to properly assess what pollution controls were
5 affordable because if Tacoma figures strongly in the long-
6 term plan that ASARCO has for Tacoma, the affordability
7 threshold may rise somewhere above what strictly available
8 financial data would indicate for the plant.
9 Moreover, if Tacoma is indeed important in ASARCO's long-
10 term strategic plan, a strong EPA standard may well
11 challenge and compel ASARCO to find a better technological
12 solution to the pollution problem and so the technological
13 frontier may not be fixed but may be moved forward by
14 concerted efforts on the part of such companies.

15 As I say, I do not see any evidence in the
16 Arthur Little study that they looked at the strategic
17 plan of ASARCO. Finally, let me say that my review of
18 the literature on plant closures reveals there is ver
19 little evidence to show plants close because of regulatory
20 costs, tax rates or anything of that kind. Usually the
21 decision is based on fundamental factors such as trends
22 in future demands, competitive threats, the level excess
23 capacity in the industry, labor costs and attitudes.

24 Thank you.

25 HEARING OFFICER: Thank you, Mr. Grunberg.

1 Any questions?

2 MR. SALO: At the hearing yesterday there
3 was a discussion of whether limiting the quality of ore
4 smelted in the Tacoma smelter to lower arsenic content
5 ores would have a drastic economic effect and cause
6 closure of the smelter. Do you have any thoughts on
7 that question?

8 MR. GRUNBERG: No, I am going hopefully
9 to study the issue more carefully but I haven't gotten
10 specific information on the ASARCO plant.

11 MR. O'CONNOR: Is the only document you
12 have the Arthur Little report?

13 MR. GRUNBERG: That is the only document
14 I have from the EPA. I was only asked to speak about a
15 week ago so that was the only chance I had.

16 MR. O'CONNOR: There is a report that has
17 been done since then.

18 MR. GRUNBERG: Can you provide me a copy?

19 MR. O'CONNOR: Yes.

20 MR. GRUNBERG: How can I get a copy?

21 MR. O'CONNOR: I'll talk to you after the
22 meeting.

23 HEARING OFFICER: Is (b) (6) here
24 yet?

25 (No response.)

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1 HEARING OFFICER: Is (b) (6) here
2 yet? (b) (6), please come and identify yourself.

3 (b) (6): My name is (b) (6)
4 I have been a resident of Tacoma for 16 years. I have
5 lived within the North End all 16 of those years. I have
6 lived (b) blocks from the smelter stack and see it every
7 day. I have three children, all born and raised in the
8 North End. My husband has worked for ASARCO for 10 years.
9 My dad has worked for ASARCO for 13 years. During my
10 husband's employment we have been through three strikes
11 and we managed to survive, but I don't know how much longer
12 my family can survive with much more pressure and job
13 insecurity. We are a one paycheck family and barely make
14 it now with the present inflation.

15 I feel ASARCO has made much progress working with
16 PSAPCA before the EPA came to Tacoma and started scaring
17 the hell out of the public with their inaccurate assumptions
18 of the possibility of cancer. We were all born with a
19 time clock in us and we are all going to die eventually,
20 with or without ASARCO..

21 ASARCO has spent \$40 million to reduce pollution
22 in the Tacoma plant and are willing to spend an additional
23 \$4.5 million for the converter hoods. They would be
24 in operation now if the EPA hadn't stepped in. When the
25 hoods are installed, arsenic emissions will have decreased

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1 94 percent, 94 percent! That is the best available tech-
2 nology available at this time. If there is something
3 better down the line, then we should look into it, when
4 it becomes available. In the mean time, let's put
5 the hoods on and let us get on with the job of making a
6 living. The stress to the employees and their families
7 is more of a health hazard than arsenic.

8 Although North Tacoma and Vashon Island
9 children have elevated urinary arsenic levels compared
10 to Olympia children, no adverse health effects have been
11 detected because of these levels. Studies by DSHS and
12 the Fred Hutchinson Cancer Research Center showed no
13 increased rate of lung cancer among persons exposed to
14 ASARCO emissions. Other studies, conducted throughout
15 the U.S. and Sweden, also indicate neither increased
16 illness or mortality associated with the community exposure
17 to smelter emissions.

18 The concern about arsenical air pollution
19 stems from studies of smelter workers who have been shown
20 to have an elevated risk of lung cancer. Although no
21 hazardous effects have been shown for smelter communities,
22 the cancer-causing potential of arsenic warrents continued
23 monitoring for any community effects. But at this time
24 we find no scientific evidence to support linking the
25 elevated urinary arsenic levels found in this study to

1 any adverse health consequences. Will science ever link
2 it? Comments in a letter from DSHS about a urinary test
3 run on a child that lives less than five blocks from
4 ASARCO indicates her test results were zero micrograms
5 per liter. My children were tested and also had zero micro-
6 grams. They are very healthy and eat cherries and straw-
7 berries out of our back yard. We also raise rabbits and
8 they or their young have not suffered ill effects from
9 emissions.

10 I have a bigger fear of my children's exposure
11 to everyday elements such as drugs, auto traffic,
12 kidnapping, etc., than of them dying of arsenic. I don't
13 consider the amount of arsenic that they breathe dangerous.
14 ASARCO mentioned something about an IBCO furnace. I would
15 love to see that put in in the future, if affordable. It
16 would improve the plant and air and give us job security.
17 Boy would that be nice. Job security is something we
18 haven't known for a while.

19 Let's keep ASARCO here. We need the industry
20 and we should keep our money in our country to support
21 our economy instead of foreign countries. We need this
22 plant, its revenue, its jobs and its products. They've
23 been a part of this community for nearly a century.
24 Are we going to depend on foreign countries for everything?
25 Tacoma's image has been ruined nationally because of this

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1 controversy. Let's continue to keep jobs and clean up
2 the air. We can have both.

3 Thank you.

4 HEARING OFFICER: Thank you. Any questions
5 from the panel?

6 (No response.)

7 HEARING OFFICER: Thank you.

8 (Applause.)

9 HEARING OFFICER: (b) (6) ?

10 (b) (6) : I am (b) (6) . Tacoma has
11 a history and a corresponding image of being a stinky,
12 little, dirty town. ASARCO has played an important role
13 in shaping this image. What Tacoma has lost in reputation
14 and quality of life, ASARCO has gained in being able to
15 process and refine into dollars that which otherwise would
16 go untapped, high arsenic content ore.

17 For nearly 100 years ASARCO has had this edge
18 to the detriment of Tacoma's environment. But now we are
19 placed not only with health risks due to on-going and
20 future emissions, but a monumental problem due to past
21 emissions and ASARCO pleads poverty. I submit that the
22 issue before you is one of health, the health of myself and
23 my family and my neighbors, not one of economics.

24 Health, in keeping with the intent of Congress,
25 must be the one non-negotiable component. The decision

1 reached must provide an ample margin of safety from
2 a no-threshold carcinogen and it should protect not only
3 healthy adults but the babies and the children and
4 other members of our society who are particularly suscept-
5 ible and who also have a right to protection.

6 There is much controversy over how much arsenic
7 ASARCO emits and how much reduction would occur with
8 the secondary hooding. The undisputed factor remains
9 that ASARCO is pouring tons of arsenic into our
10 atmosphere and neighborhoods yearly. I submit to you
11 that a ton is no small amount for a carcinogen in which
12 no threshold has been identified and confirmed. That
13 single ton of arsenic is flying around, settling and
14 being stirred up in my community and it is too much,
15 particularly when view against the background of tens of
16 thousands of tons of arsenic that have been released by
17 ASARCO during the years of its existence and deposited
18 into our air, ending up on the ground and in every crack
19 and crevice that you could imagine.

20 Surely if there is a threshold, it is
21 exceeded when an unknown individual tills his soil on
22 other than a rainy day, when an old roof is removed and
23 during dozens of other normal dust-raising activities.
24 It is my understanding from Ernesta Barnes that
25 Mr. Ruckelshaus is prohibited from considering the

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1 combined contamination from cadmium, sulfur dioxide and
2 lead. This may be so but it is an inadequacy and the law
3 ought to be challenged at this place and time. He is
4 not prohibited from considering public concerns and in
5 fact has solicited the same.

6 Therefore, as a member of the public living
7 with my husband and 8-month old child (b) (6)
8 from ASARCO's Tacoma smelter, I would like to impress
9 on Mr. Ruckelshaus the foolishness in terms of common
10 sense and caution that I would be guilty of were I not
11 to recognize the potential severity of the combined
12 effects of the toxins we are being asked to live with.

13 The EPA may be able in fact by law to separate
14 those but when you live with the problem, you cannot.
15 We must recognize first the aggregate of the toxins
16 we live with and number two, the potential increased
17 risks of these toxins interacting with each other in our
18 bodies, a factor which is quite capable of multiplying
19 the risks many times over.

20 The EPA seems to feel that the burden of
21 possibly putting 575 workers out of their jobs rests
22 upon its shoulders. This burden was placed fictitiously
23 upon and accepted by the EPA. The actual burden rests
24 solely with ASARCO. ASARCO is required by the PSAPCA's
25 Board of Directors 501 and 503 of November 12, 1981 to

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1 select and install new sulfur dioxide controls and/or
2 new smelter technology capable of capturing 90 percent of
3 the company's sulfur dioxide emissions by 1987. The
4 systems are to be identified by ASARCO and the time
5 schedule for obtaining necessary permits submitted by
6 December 31st of this year, contracts to be let by
7 July 1st, 1985. A completion of compliance is to be
8 secured no later than July 1, 1987.

9 ASARCO has already been required to decide if
10 it intends to become a responsible member of our
11 community or to relocate to another place where no one
12 cares, if such a place exists. There may be some
13 conjecture on the part of the company as to whether in
14 the final analysis they will comply but let me assure you
15 and the company, if they are listening, that I, among
16 others, intend to do everything within my power to see
17 ASARCO abide by the PSAPCA order of 1981. This order
18 was not appealed and it is binding.

19 Seemingly, in this context, it is hardly
20 unreasonable for the EPA to support our local agency's
21 action while protecting our health by requiring that
22 ASARCO install state-of-the-art technology to its control
23 of arsenic, what they consider to be cost prohibitive. If
24 the company is not prepared to make such a fundamental
25 overhaul, they need to pick up and leave, the sooner the

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1 better. By getting encouragement from Mr. Ruckelshaus,
2 whose job it is to protect my family's health, ASARCO
3 should not be allowed to evade and delay its crucial
4 decision any longer. If ASARCO finds that the potentials
5 outweigh the cost, after considering all relevant factors,
6 including most importantly the present and projected
7 copper market factors and decides to stay in its present
8 location, it must be required to spend the capital
9 necessary to bring the plant into the 20th Century.

10 Consider for a moment the impact on Tacoma.
11 Hundreds of jobs to rebuild the plant. Those jobs would
12 occur often in a modern, fine-tuned facility, benefiting
13 workers and the outside community, a more healthy
14 environment for the workers and the community and there
15 would be fiscal benefit to Tacoma in terms of the "New
16 Beginnings" concept, a message to the entire country that
17 Tacoma cares profoundly about the quality of life and its
18 environment, that Tacoma is changing, no longer soliciting
19 jobs at the expense of quality of life, a strong signal
20 to scouting industries that ours is not a place where
21 free license to defile the environment can be considered
22 an advantage. A strong signal to responsible businesses
23 and industries who do not want something for nothing but
24 seek desirable, quality living environment to attract
25 a solid, well-grounded labor force. Any successful

1 businessman or woman knows that a good environment is
2 worth its weight in gold. Tacoma is trying concertedlly
3 to change its past image to attract clean industries and
4 tourism, to project a respect and reverence for quality
5 living. ASARCO can be a part of this New Beginning,
6 it can drag Tacoma back into the mire or it can hit the
7 road. There is no question but that the first and last
8 alternatives are the ones that would protect the health
9 of the people of Tacoma, with the first being preferable.

10 We do not want a bandaid for the problem; we
11 want a solution. I call for a maximum 24-hour arsenic
12 concentration of 1 microgram per cubic meter of air
13 and an average annual maximum arsenic concentration of
14 .2 micrograms per cubic meter of air.

15 Any ambient air standards that are set by
16 this EPA hearing must be closely followed, strongly
17 enforced and if not complied with, instantly penalized.
18 I also urge that on-going testing and community studies
19 be funded by ASARCO and carried out by an appropriate
20 public agency.

21 In closing I am reminded of what it took for the
22 EPA to be promoted to address this issue, a court order.
23 It is my hope that it won't take a court order to
24 prompt the EPA to address the issue of cadmium emissions
25 of ASARCO into our community. Finally I would like to

1 acknowledge the political significance of this decision
2 in the 1984 presidential campaign. A decision which
3 favors ASARCO's pleas of poverty undermines the
4 message of importance of the health of my family and
5 my neighbors and this promises to be a political liability
6 of national consequence for Mr. Reagan whose environmental
7 policies to date have been, to say the least, atrocious.
8 The country will be watching.

9 Thank you.

10 HEARING OFFICER: Any questions from the
11 panel?

12 (No response.)

13 HEARING OFFICER: Thank you very much.

14 Is (b) (6) here?

15 (No response.)

16 HEARING OFFICER: The next person is
17 (b) (6) and I believe (b) (6) has testified.
18 If he is here that indicates that I am wrong.

19 (No response.)

20 (b) (6) ?

21 (b) (6) : My name is (b) (6) and
22 I think the gist of what I was going to say was just said
23 by (b) (6) before me very thoroughly. I request that
24 the EPA place more stringent pollution controls on
25 ASARCO and set an ambient air standard for arsenic based

1 on the known fact that arsenic is a human carcinogen.
2 It is unfair that the public has to have a choice between
3 environmental and health concerns or potential job loss.
4 Job attention very likely would increase if incoming
5 light industry knew that the effects of the smelter were
6 greatly diminished. My choice is to protect the health
7 and environment of the people of Tacoma, even if the
8 smelter must close. That is all.

9 HEARING OFFICER: Thank you very much.
10 Are there any questions?

11 (No response.)

12 HEARING OFFICER: (b) (6) ?

13 (b) (6) : My name is (b) (6) and
14 I and (b) (6) have lived at (b) (6) in
15 Tacoma, that's about a half mile south of the smelter
16 for the last ten years. I represent no special interest
17 group but I present the following testimony as a parent
18 and a taxpayer and a concerned citizen of Tacoma.

19 I was born in Tacoma and have lived half of my
20 38 years within a (b) (6) radius of the stack. Now
21 for openness let me say that I believe strongly in the
22 free enterprise system and the right of industry to make
23 profits. I also believe that economic factors rather
24 than excessive government regulation should be the
25 primary determinant which dictates the growth or demise

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1 of an industry. However, having said that, I also believe
2 that regulatory agencies should not bend the rules by
3 which industries operate in order to give one company an
4 advantage over its competitors. Industries, like people
5 and government, must change with the times lest they become
6 extinct dinosaurs.

7 Now EPA's proposed modification to ASARCO's
8 turn-of-the-century copper smelter in Ruston seems
9 to give ASARCO the competitive edge by allowing the
10 smelter to continue to subject the residents of North
11 Tacoma to a significantly higher level of emissions than
12 would be permitted in the vicinity of other copper smelters
13 in other parts of the country. Additionally, the
14 lack of a specific level of arsenic exposure in the EPA
15 proposal encourages ASARCO to continue its Tacoma smelter
16 operations with 19th Century technology while economics has
17 forced other copper smelters into the 20th Century plants
18 and equipment.

19 Now, having a vested interest in the outcome of
20 these hearings, I studied the Environmental Impact State-
21 ments for ASARCO SO₂ varients granted by Puget Sound Air
22 Pollution Control Agency in 1981 as well as published
23 statements by ASARCO, the EPA and Puget Sound Air
24 Pollution Control Agency relative to the proposed standards
25 for inorganic arsenic. Although I do not claim to

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1 understand all the contained material therein, my lungs
2 and my throat have been aware of the fact that ASARCO has
3 done surprisingly little in recent years to comply
4 with published SO₂ emission standards. Now how then
5 can recipients of ASARCO's fallout be assured that ASARCO
6 will continue to commit to a safe level of a known
7 carcinogen when no specific arsenic level has been
8 proposed based on ASARCO's foot-dragging record in
9 past years, I have difficulty believing that ASARCO's
10 corporate offices in New York have placed a high priority
11 on the health and safety of Tacomans.

12 We have heard testimony of many older people
13 who have lived most of their lives in the vicinity of
14 ASARCO and the smelter here. And having grown up in the
15 same area, I can verify the truth of their statements,
16 where I also know many healthy senior citizens and they
17 also have lived in the vicinity of the smelter. However,
18 I have known more than a dozen others, also from North
19 Tacoma, who are not here to testify because their lives
20 were snuffed out by cancer prior to reaching 40 years of
21 age. I mention this in their behalfs because fate did
22 not grant them the opportunity to be here. Still it would
23 be foolish to fault the smelter for the untimely deaths
24 of all those childhood acquaintances just as it is foolish
25 to praise the smelter for giving health to those retired

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1 senior citizens. I, a nonsmoker, have personally experienced
2 chronic bouts with bronchitis while living in Tacoma.
3 My children seem to be down with respiratory problems
4 more often than those living elsewhere in the vicinity.
5 One of my children was born with a nervous system disease
6 that will affect his performance for his entire life.
7 Although I cannot statistically blame these problems on
8 the smelter, these afflictions are nevertheless very real
9 and very painful. Many a Summer day when there is stale
10 air and temperature inversions, the sulfur-laden air made
11 my eyes water and my throat burn and rendered me and
12 my children unable to work or play within the confines of
13 our own yard. Now the low-level arsenic experiences are
14 not nearly so painful as the carbon dioxide but the long-
15 term effects are potentially more dangerous.

16 A slightly annoying smell of halitosis that
17 emanates occasionally from the bag house seems to be the
18 major site that may affect future arsenic emissions to
19 me. I have observed over the years that lawns and plants
20 do not grow quite as well near the smelter. I have in years
21 past planted several trees in my yard and have done quite
22 a bit of organic gardening. Many plants have borne fruit
23 but others have not. I no longer plant any leafy vegetables
24 due to the likelihood of absorbing arsenic in the air.
25 Needless to say I wash everything thoroughly. For two

1 sumners however, 1976 and 1981, nothing seemed to grow
2 and I was advised to turn everything over and bring in new
3 top soil due to a heavy dose of arsenic, cadmium and
4 sulfur dioxide which our yard had received due to stack
5 fires and belching from the stack.

6 I am convinced were the ASARCO smelter located
7 upwind of a wildlife sanctuary, its operations would be
8 curtailed due to its affect on plant and animal life.
9 But the smelter lies smack dab in the middle of a residential
10 area. Isn't human life just as important as plants and
11 animals? Fortunately, Point Defiance Park has been
12 spared most of the harmful side effects. Due to its
13 up-wind location and the topography of the area, it
14 prevents most of the smelter fallout from reaching the
15 park.

16 In view of the above testimony, I implore the
17 EPA to consider in their decision process not only the
18 very real economic problems of the ASARCO smelter and
19 the valid concerns of the 500 plus smelter workers and
20 their families as well as the 600 residents of Ruston
21 whose tax base is supported largely by ASARCO, but to
22 also consider the environmental, social and physiological
23 effects on the much larger population of North Tacoma
24 and Vashon Island who derive no economic benefit from the
25 smelter and must suffer the full brunt of its environmental

1 foot-dragging. The blighted landscape, the toxic slag
2 dump in Commencement Bay and the acid rain effects should
3 also be considered in your decision. Please consider
4 also the economic future of the city wherein 19th Century
5 smoke-stack industries have been permitted to poison our
6 environment, thus discouraging 20th Century new technology
7 industries from establishing here. I implore you at the
8 very least to establish and enforce a specific maximum
9 exposure level of arsenic that we human guinea pigs
10 have to live or die with.

11 (Applause.)

12 HEARING OFFICER: Thank you, (b) (6) .

13 Any questions from the panel?

14 (No response.)

15 HEARING OFFICER: Thank you. (b) (6) ?

16 (b) (6) : Gentlemen, my name is (b) (6)

17 and I came here to discuss living in the shadow of the
18 smoke stack. I am a Tacoma native also and I have lived
19 there for roughly 20 years in Ruston. I am here to state
20 that along with most of my own community I regard the
21 ASARCO smelter as a very good neighbor. I have lived
22 within sight and sound of the plant for 14 years and I
23 am very comfortable raising my children there.

24 I am a little unprepared and I am going to end
25 up talking off the top of my head for a good deal of this

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1 but I am personally acquainted with second and third
2 generation families in Ruston. It is a very old
3 community. These people have lived there, raised their
4 families there, had their gardens there and are octogenarians
5 now who tend their gardens, can the produce, eat it and
6 live beautifully.

7 The issue as I understand it is assumed
8 risk. We have arsenic in the atmosphere. We assume that
9 is going to be hazardous to our health. The people that
10 I have in mind have been living in Ruston since way
11 before any modification of the plant, before there was
12 any curtailment of any of these particulates. Perhaps
13 it is just a coincidence but they have lived very, very
14 well. In my own block right now, I'm talking about
15 three streets, the one behind me, the one I live on and
16 the one across from me, out of 5 houses, two are retired;
17 on the street I live on, out of six households, three
18 are pensioners; across the street there are five houses
19 and three families are retired. That's an average of
20 50 percent and these people have lived an average of
21 40 years there. That's an average of 40 years and I can
22 document that.

23 A lot of people are not sure what this hearing
24 is about and I feel like I speak for a number of them in
25 asking what is this, what's going on here? All of a

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1 sudden we have a problem?

2 It was my pleasure to know Rou Murphy. He
3 was for many years Mayor of Ruston, Chairman of the
4 School Board of Ruston and he was and I believe his
5 record stands, the longest single employee of the ASARCO
6 smelter. He was 45 years working there. He retired at
7 age 65 and he died (b) (6), not
8 (b) (6). Also you gentlemen may
9 be aware and you may not that the closest high school,
10 you're talking about our children, the closest high
11 school to the smelter is directly in the wind path,
12 Wilson High School and my kids go there and I am very
13 proud to tell you that Wilson has the state championship
14 track team, not for one year but for the past 15 years.
15 Maybe one or two times they didn't win the state champion-
16 ship. We're talking about running cross country. These
17 are kids who have been raised in this neighborhood and they
18 run miles and miles daily training, year after year.
19 They have not suffered any ill effects evidently or they
20 would not be the state champions, not just for Ruston,
21 Washington but for the entire state.

22 We're discussing employment of about 1,200 or
23 1,500 families when you consider the support services to
24 the smelter compared to a milimicrogram particulate of
25 arsenic, what does the paper say, one cancer death maybe

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1 a year and nobody knows. I feel that I was in great
2 risk getting in my automobile and driving down here and
3 I am living in the shadow of the smoke stack. Every
4 day on my newspaper's front page I read that someone has
5 been found dead about once a week in the Pierce County
6 area. Somebody dies because of automobile accident but
7 nobody is trying to legislate them away and they really are
8 dead.

9 As far as my children are concerned, the
10 smelter has tested my daughter's annual growth and a
11 control group in South Tacoma or someplace else and
12 provided me personally with the results of the testing
13 at no expense to me. The test results have never been
14 different than the kids anyplace and she was born there
15 and has lived there all her life.

16 I really think that I have made my point.
17 I speak for myself and Ruston citizens, we feel the
18 benefits of this plant far outweigh the potential
19 "assumed" health risks and we feel there is only one
20 select group of self-centered elitists who have decided
21 that their interests outweigh the needs and best interests
22 of the majority of the population and now we find our-
23 selves conducting this kind of a hearing.

24 Thank you very much for the opportunity to
25 speak my piece.

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1 HEARING OFFICER: Thank you. Any
2 questions?

3 (No response.)

4 HEARING OFFICER: Is (b) (6) here?

5 (No response.)

6 HEARING OFFICER: (b) (6) ?

7 (b) (6) : My name is (b) (6) . I
8 have lived in Tacoma for about 36 years. I retired from
9 the Tacoma smelter after 30 years of being exposed to
10 arsenic and after all the hysteria from the news media,
11 I still do not think I will die from all the arsenic I ate
12 while working at the smelter.

13 I belong to a club called the 25 year club.
14 That is a group of people who have worked at the Tacoma
15 Smelter for 25 to 50 years. There are now 328 members
16 still living. 244 of them are retired. The oldest is now
17 93 years old. I ask the news media why are any of these
18 men and women still living?

19 The smelter has been there for over 90 years
20 and there were no controls for many years. So again I
21 ask the news media, why hasn't the arsenic killed hundreds
22 of people in the north end of Tacoma and the surrounding
23 area? As far as I know, the people in the north end of
24 Tacoma live just as long as the people from the south end
25 of Tacoma. I know of some smelter workers who smoke

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1 two to three packs of cigarettes a day. Cigarettes do
2 cause lung cancer and yet still the government subsidizes
3 the tobacco industry. Our taxes help pay for the
4 cigarettes. Now how do you know if the cancer is caused
5 by the arsenic or the cigarettes?

6 The Tacoma smelter has spent over \$30 million to
7 clean up the air in and around the smelter. And now the
8 news media has caused a hysterical condition that has
9 caused some people to try to shut down the smelter.

10 If the news media would apply the same
11 hysterical tactics against cigarettes, they would be doing
12 more good and saving more lives.

13 Arsenic in commercial products is sold for the
14 purpose of killing either insects, vegetation, rodents,
15 or other animals. Yet, Swiss Alpine climbers are said to
16 eat small amounts of arsenic to improve their strength
17 and stamina. A little arsenic in poultry feed causes
18 greater and faster growth in chickens.

19 Commercially arsenic is useful to the ceramic,
20 glass, wallpaper, paint and pharmaceutical industries.
21 So why is the news media causing all of this hysteria?

22 HEARING OFFICER: Thank you. Are there
23 any questions of (b) (6) ?

24 (No response.)

25 HEARING OFFICER: Thank you, (b) (6) .

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1 HEARING OFFICER: Is (b) (6) present?

2 (No response.)

3 HEARING OFFICER: (b) (6) ?

4 (b) (6) : Ladies and gentlemen, my
5 name is (b) (6) . I live at (b) (6) in
6 Tacoma. I am not affiliated.

7 I want to thank you for the opportunity to
8 comment on the proposed arsenic standards. Even though
9 I have serious reservations about the public's and my
10 own ability to completely understand the technical issues
11 at hand, it is most important that we have an opportunity
12 to express our views.

13 I want to express my support for the position paper
14 that has been presented by the Tahomans for a Healthy
15 Environment. As a concerned citizen who is not a member
16 of their group, I appreciate their efforts in the protection
17 of the environment.

18 Emphasizing two of their points, I feel that
19 the Environmental Protection Agency must provide the
20 public with an ample margin of safety when it sets the
21 final arsenic emission standard. I believe an ample
22 margin of safety is controlling arsenic emissions to
23 the point that the number of cancer deaths from those
24 emissions be infinitesimally small.

25 Also, I strongly believe that economic

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1 considerations should not be a factor in the final
2 emission levels. It is not the role of the Environ-
3 mental Protection Agency to protect ASARCO's financial
4 health but to protect the public's health.

5 Finally, we, in the community, have no ability
6 to directly control ASARCO and its emissions, so I am
7 calling for the Environmental Protection Agency to
8 vigorously protect the public's health and environment
9 when it sets the final arsenic emissions level.

10 Thank you.

11 HEARING OFFICER: Thank you, (b) (6).

12 Any questions for (b) (6) ?

13 (No response.)

14 (b) (6) . Is (b) (6) here?

15 While (b) (6) is coming forward, is (b) (6)
16 here? Maybe (b) (6) would come up closer with
17 (b) (6) and he can testify right after him.

18 HEARING OFFICER: (b) (6) please come
19 up and identify yourself. I don't know if you were here
20 earlier and maybe I should repeat this but the basic
21 rule is that each person gets a maximum of 10 minutes.
22 When you have one minute left, I will let you know.

23 (b) (6) : Members of the panel, ladies
24 and gentlemen. My name is (b) (6) . I reside at
25 (b) (6) and have done so for about 25 years.

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1 I lived for 15 years by the good ASARCO doctor's advice
2 that, "If the pollution gets too bad, go indoors."

3 First I would like to congratulate the
4 Washington State Department of Ecology for their stand
5 in favor of ambient air quality standards. It is really
6 refreshing when a government agency actually comes up
7 with action proposals which serve the public's interests
8 rather than bending to the pressure politics of big
9 industry.

10 I would also like to express my thanks and
11 support for the clear and comprehensive proposal presented
12 by Tahomans for a Healthy Environment.

13 It is good to see the old-timers, Ruston
14 residents and past-ASARCO workers out to support the
15 company in its hour of need. They are a tribute to the
16 adaptability of the human nervous system. However, I keep
17 waiting for them to get to the bottom line. They talk
18 about how ASARCO has been good to them and good to Ruston,
19 how ASARCO paved the streets and alleys. A friend, who
20 is a Ruston resident, recently confirmed a fact I had
21 heard, that Ruston residents pay the same wholesale
22 electric rates that ASARCO enjoys. Quite a savings these
23 days, mind you. I wonder if there isn't some financial
24 considerations involved in the testimony of the Ruston
25 residents?

1 I enjoyed the testimony of the old-timers when
2 they proudly reveal the facts which are hard to obtain,
3 information that over half of the ASARCO work force has
4 served there over 25 years. If worse comes to worse
5 for the ASARCO operation, it sounds like many workers
6 would have retirement as an option.

7 But there is a gap in the testimony of the old-
8 timers. A convenient gap for ASARCO as expressed in an
9 old saying, "Dead men tell no tales." I invoke the memory
10 of those dead workers whose contribution was rewarded by
11 an early grave, due to ignorance, due to callous attitudes
12 about environmental pollution, whatever the reason, the
13 testimony of those dead holds a lesson for us as we plan
14 for the future of our children.

15 The call for pollution-free ambient air standards
16 deserves the support of local labor unions. Union workers
17 would benefit in at least two ways. First, the quality
18 of the work environment would be improved, benefiting
19 workers as well as local residents. Second, unions
20 would be busy with the jobs generated by the building and
21 rebuilding of pollution control equipment. My father's
22 company was among many in this area who worked double and
23 triple shifts when ASARCO built and installed liquid
24 SO₂ pollution control equipment. Further control of
25 pollution can generate more jobs in the community.

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1 For those of us who have heard it before, the
2 ASARCO testimony has a familiar ring. The corporation
3 sends us paid professionals from other parts of the nation
4 to tell us our air is clean and everything is fine.
5 They then whine about the depressed copper market and
6 threaten workers with going out of business if they have
7 to control pollution. What they don't talk much about
8 are the components of the so-called "dirty ores";
9 non-ferrous, non-copper components (gold and silver)
10 which mean huge profits to ASARCO, so long as no one
11 rocks the boat by demanding better control of pollutants.

12 I would like some expert testimony on ASARCO's
13 status as a "free port". I wonder how much tax revenue
14 is lost in that grandfather clause?

15 ASARCO 's now classic barrage of propaganda
16 is well tailored to reduce the public's brain to mush,
17 enabling ASARCO to continue business as usual. Had the
18 company decided years ago to act conscientiously to
19 control pollution, it could have deferred the huge costs
20 of operating its propaganda machinery and environmental
21 pollution would not have become such a costly problem
22 to solve now, so late in the game. The company chose
23 the path of perpetrating ignorance, now it must pay the
24 costs.

25 If Pierce County's "New Beginnings" campaign

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1 is to amount to anything more than a paper-shuffling
2 bureaucrat's dream, then the leaders of this community
3 must take a stand to force pollution-generating industries
4 to clean up their operations. The mayor, city council
5 members, port commissioners and others must take a
6 stand on these important issues and look objectively at
7 these pollution industries whose benevolence at election
8 campaign-donation time is severely counterbalanced by
9 the reality of this community domination by smokestack
10 industries.

11 Let the results of this hearing be a clear
12 and forceful statement to ASARCO and other pollution-
13 generating industries that the time has come to clean up
14 their operations or get out of the Northwest.

15 Thank you.

16 HEARING OFFICER: Thank you (b) (6).

17 Any questions?

18 MR. O'CONNOR: Could you illuminate me
19 about the freeport issue?

20 (b) (6): I would like to challenge
21 that.

22 HEARING OFFICER: Thank you.

23 (b) (6): ?

24 (b) (6): Thank you ladies and
25 gentlemen. Thank you for the opportunity to have a say

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1 in this meeting here tonight. I have been called an old-
2 timer, I guess by the younger person. I would like to
3 know what he does for a living. It would be kind of
4 interesting.

5 (b) (6) : I formerly worked at ASARCO.

6 (b) (6) : It is interesting to
7 find out what some of these people do because, sure,
8 some of them work for ASARCO to get started but then
9 they find other jobs somewhere and they condemn the place
10 that actually gave them a start.

11 Incidentally, my name is (b) (6).
12 I kind of got carried away with some of the things
13 that were said but I worked for ASARCO for 35 years.
14 I have lived within (b) (6) of the stack for 42 years.
15 I am now 67 years old and I have been retired for quite
16 some time so it makes no difference to me whether the
17 smelter continues to work or close down.

18 ASARCO has been a good neighbor to everyone that
19 has ever worked there. I would like to see them to
20 continue to operate with a minimum amount of controls.

21 So far, about the only problem that has been
22 created has been with the people who are working at ASARCO.
23 They provide coveralls, a special type that the company
24 washes and takes care of and they have us wear respirators
25 which creates a problem for the breathing and working but

1 these are some of the things that enter into my mind.
2 I remember when I started working there there was in the
3 neighborhood of 1,600 men working there. At this time
4 it is under 500. This is because of the problems that
5 have been created over the years, cutting down the
6 refinery, shutting down the casting house, shutting down
7 the slime house, the nickle plant and all these
8 places, they have all been closed because of certain
9 areas that slowly but surely ASARCO will have to quit.
10 And then when ASARCO is done and perhaps Hooker Chemical
11 and some of the other places that are now giving our
12 people jobs, they'll be attacked as ASARCO is and we
13 don't feel that this is fair because they do really and
14 truly a large amount of good for the community.

15 Thank you for giving me this opportunity.

16 HEARING OFFICER: Thank you, (b) (6).

17 Any questions from the panel?

18 (No response.)

19 HEARING OFFICER: Thank you very much.

20 (Applause.)

21 HEARING OFFICER: Let me go back and see
22 if the one person who hasn't shown up, the last time I
23 called, (b) (6) ?

24 (No response.)

25 HEARING OFFICER: Is (b) (6) here?

(No response.)

HEARING OFFICER: (b) (6) ?

(No response.)

HEARING OFFICER: (b) (6) ?

HEARING OFFICER: Please identify yourself for the record when you get to the podium.

(b) (6) : I am (b) (6) and I have lived in the state of Washington, in the Tacoma area 35 years. I went to work for the Tacoma smelter in 1959. Next May I will be 70 years old. I consider my health excellent after putting in 20½ years at the smelter. Some people who I have associated with over the years regard me as an out-spoken individual and that is what I am going to do, be out-spoken here tonight.

We had one of our members, union members, that was a fire chief down at the smelter and he just passed away Monday afternoon. He was 86 years old. He didn't die of cancer. Any old-timer that has died, I don't know of anyone up in years who has died of cancer. It is always some other cause. It is generally because of kidney failure or liver failure. He was 86 years old.

When I first came to the smelter our workers in the plant were attempting through the years to try to clean up that plant. We didn't get any support from the outside. They knew we were union members and they said

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1 we were trying to shut the plant down. And we were
2 branded in the press that we were "commies". Now maybe
3 nobody has made that reference here at this hearing but,
4 by golly, I was branded as a communist, and I am no more
5 a communist than is this box that this microphone is
6 sitting on. I take exception to that. I was born in these
7 united states and I figure that I am a dog-gone good
8 American. They tell me that you can't, you got to
9 tell people to do this. I had two sons in Germany at
10 the time of the Vietnam War and they both volunteered to
11 go to Vietnam. I had people tell me, "Well, you can't
12 let two sons of yours go to Vietnam." and I said, "Well,
13 that isn't my business where the heck they want to go.
14 If they want to go there, they'll go." and so they both
15 went and they're still alive and they still live in the
16 United States and they make no claim that they did anything
17 wrong by going to Vietnam.

18 In (b) I was elected president of the union,
19 of the Mine, Mill & Smelter Union. We had one-year terms.
20 We had a lot of problems. It was a bad year. We had bad
21 economics and somehow or another we had a thing that was
22 called an illegal strike and we were out from some time in
23 March until the middle of June. Well, being president, I
24 got fired for union activity but it didn't stick. They
25 can't fire a man for union activities if he's an officer.

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1 But, anyway, I still took the position that
2 I have today. I have no objection to young people
3 expressing their ideas. I think that is good. But I
4 don't think our young people understand the value of
5 a metal smelting and refining plant that is 93 years old
6 here in the Tacoma area. I think it should be kept
7 operating and not shut down. I listed over the months
8 now, through the summer, to this doctor and that doctor
9 and there is still no proof that arsenic emissions has
10 caused cancer.

11 I came out of Minnesota off a little old rocky
12 farm back there and we used to use arsenic to spray on
13 our potato plants. Everybody did it. We used arsenic
14 dust that came out in the 30's and I sprayed the potatoes
15 with it and so I can say I've been with arsenic for over
16 50 years. I don't think it hurt me any so I don't think
17 the arsenic from the smelter has hurt me and I don't see
18 where it has hurt anybody else and there is no one yet--
19 I was here yesterday and there is a difference of opinion
20 among the doctors but they can't tell us, "Well this guy
21 died because of the fact that they had arsenic emissions
22 from the smelter."

23 I lived 19 years there, I just moved from there
24 this summer. I lived 19 years within a mile of the smelter.
25 I raised vegetables every year and a whole bunch of

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1 rasberries and we ate all that stuff over the 19 years.
2 That's a pretty long period. There should be something
3 show up if it's going to and we don't see any different
4 effects on us.

5 I have known families, the whole family
6 except one member died, all girls and two boys, one
7 boy worked his whole life down there at the smelter and
8 he didn't die of cancer, he died of a heart attack. All
9 the rest of the family over the years died of cancer.
10 Now I don't say the smelter caused the cancer in that
11 family because they weren't even near the smelter and
12 furthermore, through the midwest and through the
13 United States people are dying off with cancer far more
14 than they are in the Tacoma, Washington area.

15 Well, that's my testimony. I suppose I could
16 go on a lot longer here but I think you get the gist of
17 what I am saying. So I'll just thank you for listening
18 to me.

19 HEARING OFFICER: Thank you, (b) (6) .

20 (Applause.)

21 HEARING OFFICER: Are there any questions
22 for (b) (6) ?

23 (No response.)

24 HEARING OFFICER: Do we have any other
25 witnesses who have signed in?

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1 (b) (6) : My name is (b) (6) and I
2 reside on Vashon Island, (b) (6), Vashon 98070.
3 I live on what is called the West side, about the middle
4 of the island. By profession I am an attorney. I
5 practice in Seattle, Washington. We grew up in Tacoma
6 and I was involved as one of the leaders in a group
7 called "Gasp-Tacoma" in the early 70's. We represented
8 the Tacoma Audubon Society and other environmental groups
9 when PSAPCA adopted their emission regulations. After that
10 I went to law school and for five years I was employed in
11 the Office of the General Counsel of your organization.
12 For two years I was a law clerk and for two years I was
13 an attorney. Basically I was in the Pesticide Litigation
14 branch. I was stationed in DC for two years, until 1981.
15 I spent one year in San Francisco and one year in the
16 region. I wasn't part of the regional staff; I was
17 part of the headquarter staff.

18 Basically I would like to make some critiques
19 on some of the proposals as an attorney. I guess I'll
20 first go into Section 112 in the Federal Regulation
21 the Administrator requested, on Page 33116 some comments
22 on how they interpret Section 112. Basically what they're
23 saying is "EPA's interpretation of Section 112, that
24 the smelter should be controlled at least to the level
25 of BAT to a more stringent level than necessary to

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1 unreasonable risks." Now I don't have any problems with
2 that, as far as the statute is concerned. But the next
3 sentence, which is on Page 33131 states, "The decision
4 as to whether the rating is reasonable is based upon
5 consideration of the individual population risks,
6 consideration of the impact and the cost, economics of
7 impact associated with further reduction of these risks."

8 Well, the problem with that analysis is that
9 is the administrator is saying in Section 112, you can
10 consider the economic risks. If you look at Section 112,
11 economic risk is never mentioned. They mention analysis
12 but it is never mentioned in comparison to the other
13 sections. Section 111, Performance Standards, it is
14 specifically stated in the statute that you can consider
15 the costs of the pollution control in setting your
16 standards.

17 Now if you look at Section 112 more carefully,
18 especially Section E which says, "Design equipment, work
19 practice, operation standards..", it says in the "Judgment
20 of the administrator, it is not feasible to prescribe
21 enforced emission standards that the administrator may
22 promulgate a design of equipment or practice or operational
23 standard to protect the public with an ample margin of
24 safety." and it further defines--Section 2 further
25 defines the phrase "not feasible to prescribe enforced

1 emission standards." and that section is specific in
2 stating that if there's nothing technologically feasible,
3 no economics involved, just technologically feasible,
4 that the administrator can also promulgate rules for
5 practices, within the statute, even though it doesn't
6 specifically state economics may not be considered the
7 way it is structured and the way it operates, economics
8 cannot be considered.

9 Furthermore, to buttress my position, is that
10 under Section (c) prohibiting act exemptions, the second
11 subparagraph states, "the president may exempt a stationary
12 source from compliance if it's in the national interest."
13 It says--well, national security. Basically what I am
14 stating is that Congress, when it adopted Section 112,
15 basically they did not agree with the administrator in
16 his analysis of stating that economics may be used.

17 Now I'd like to further state that in the proposals
18 you state that if the BAT is not sufficient, you may
19 regulate the amount of arsenic content in the ore and
20 basically my reading of the interaction, the EPA
21 administers, it is my understanding that such a proposal
22 has never been adopted before by EPA in the sense that
23 EPA can say, "O.K., if you smelt a certain ore and burn
24 a certain coal, you must then put in such technology to
25 prevent the limits of certain pollution from happening."

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1 He's never gone out and said, O.K., your industry, if
2 you're going to do this, you can only smelt certain ores.
3 It is my position that is not a legally tenable position.
4 Limiting the percentage of arsenic in the ore to reduce
5 the pollutants that result after smelt.

6 Basically the reason I bring that up and this
7 is a long, long on-going battle. It didn't start last
8 year. It started in the 40's and 50's. In fact when
9 I first started in 1970 these people showed up and were
10 very cynical because it was taking so long. Basically
11 for me it has been 13 years. It has taken a long time.
12 What happens is the smelter has very good legal counsel
13 and they will delay things. For example the adoption
14 of the order, legal counsel for the smelter delayed
15 actions by the local agency PSAPCA through challenging
16 whether an Environmental Impact Statement was needed or
17 not and basically that was all about six wasted years,
18 from 1975 to 1981 before something was done.
19 I am just real concerned that if you determine additional
20 controls are needed above what you consider BAT that
21 you will or might adopt a certain lower concentration
22 limitation which would result in further litigation.

23 I would like to continue by indicating that
24 I believe that the emission standards that we adopted,
25 my personal belief is that the emission standard should

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1 be zero. Basically the law requires that it be such
2 that there would be an ample margin of safety. What
3 the statute appears to be stating is, to my interpretation,
4 that an ample margin of safety is related to what is
5 technologically feasible without the economical reasons
6 considered.

7 Basically the position that PSAPCA has taken,
8 the position that EOE has taken and basically they have
9 without so stating adopted emission standards, the
10 emission standard of basically as low a reduction as is
11 technologically feasible.

12 I urge basically, what I would like to do is
13 incorporate a risk analysis that Mike Morgan made that
14 the University of Washington in a sense is stating that
15 your assessment is about right, that is it is not reckless.

16 I would like to conclude, I believe that
17 the EPA should adopt a near zero admission standard and
18 that the plans and position papers that DOE and PSAPCA
19 has given to you should be looked upon as a sample
20 proposal of limitation plans of emission standards.

21 Thank you.

22 HEARING OFFICER: Thank you, (b) (6)

23 I think we have a question.

24 MR. SALO: You said it was impermissible
25 for the agency to set up limits for arsenic emissions.

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1 Could you develop that a little bit?

2 (b) (6): I understand the EPA never
3 limited the intake of certain industrial plants for
4 pollution control reasons. What basically the plant wants,
5 as I understand, adopt, smelt or burn high-sulfur coal
6 or let's take the high-arsenic ores. If they do such
7 then EPA can set certain pollution standards or certain
8 technology can be required. I don't think the EPA
9 should be in the position of telling certain industries
10 how to run their business other than this is our mission,
11 our mission is to reduce the emissions to a certain level
12 and you decide how you want to do it. This is it
13 and you decide economically and technically how you want
14 to do it. Basically I think it's a dangerous position
15 to take in the sense that it has been untested. I don't
16 think this is an appropriate place to do it.

17 MR. SALO: Let me pose an example.
18 Suppose the emission limit stated the emissions can't be
19 more than so much arsenic per ton of ore used. Would
20 you consider that legal or what?

21 (b) (6) Yes but not stating that you
22 can't smelt high-arsenic ores. I'd like to make just
23 a technical suggestion. As I understand it, you are
24 proposing that certain conversions be hooded and I
25 would recommend that the converters be designed in such

1 a way that if this air current method doesn't work,
2 that certain doors could be placed over it that you
3 might basically, in the event that this air current
4 method doesn't work because of work practices and
5 maybe just design failure but at least you have something
6 you can retrofit over the pollution control and it won't
7 be all wasted.

8 HEARING OFFICER: (b) (6), I have a
9 question. You indicated that you have doubts as to whether
10 the EPA could seek to regulate the type of ore, is that
11 right?

12 (b) (6) That's right.

13 HEARING OFFICER: You hold that position
14 even though the statute says that the EPA under certain
15 conditions can regulate work practices?

16 (b) (6): My interpretation of
17 "work practice" is telling the worker how to do certain
18 work. Work practice to me may sound like work oriented.
19 Work practice to me sounds like an OSHA requirement, like
20 the statute allows you to infringe on OSHA territory.

21 HEARING OFFICER: You don't think this
22 would include the type of ore?

23 (b) (6): I don't think that was the
24 intent of congress. They weren't thinking that EPA could
25 go in and start telling people how to run their business.

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1 I strongly recommend what all the other commissions,
2 PSAPCA, DOE and all the other organizations that you
3 adopt and that's my position, the BAT, at least that's
4 the minimum that be required in the statute.

5 HEARING OFFICER: When you say BAT
6 would that include any sort of economic factors?

7 (b) (6) : I indicated that the statute
8 doesn't allow you to do that. You can design a certain
9 system that starts with BAT, if you determine that
10 BAT is not stringent enough to allow an ample margin of
11 safety, then you go to the next step. You are just
12 making sure that there is an ample margin of safety
13 and basically the administrator is doing that in the
14 proposal except in determining what a reasonable risk is,
15 he is also including economic factors there and that is
16 not reasonable, as I read the statute.

17 HEARING OFFICER: Assuming that there is
18 no threshold of safety with carcinogens, in your
19 analysis, then that puts it, it goes directly to the
20 feasibility?

21 (b) (6) Basically it's a risk
22 assessment analysis and basically what I think the EPA
23 needs to do is set some kind of an emission standard,
24 for example, the tall stack, fugitive emissions, converters
25 and roasters and then establishing those emission standards

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1 then allow ASARCO, the state or PSAPCA to determine how
2 to meet those emission standards.

3 HEARING OFFICER: If there's no margin of
4 safety, how do you determine what these emission standards
5 should be?

6 (b) (6): You have to make a judgment
7 on what an ample margin of safety is.

8 HEARING OFFICER: What would you consider--
9 I think we're talking about one of the more difficult
10 things.

11 (b) (6): I know and I just don't
12 like to respond to that. Basically no one really knows
13 so you just determine what the emissions are from each
14 portion of the plant and I'm not sure what your modeling
15 looks like or what it entails, but basically you have set
16 certain risk factors. The risk factors at one time were
17 100,000 to 1 or a million to 1 and I just recommend
18 those similar risk factors be adopted. I don't see why
19 Tacomans or people on Vashon Island can't be subject to
20 a risk factor of 1 to 1,000.

21 HEARING OFFICER: You say the agency does
22 have to establish a risk factor which it deems acceptable?

23 (b) (6): Yes, that would provide an
24 ample margin of safety. That's right.

25 HEARING OFFICER: It's your interpretation

1 the agency cannot consider economic factors in doing so?

2 (b) (6) : That's correct. It's a legal
3 matter. They work in the benefit of the people in
4 determining whether they believe economically they can
5 afford it or not but as far as legal matter, that's not
6 permissible under the statute and basically my position
7 is bolstered by the fact that all other sections of the
8 Act, at least the Clean Air Act, specifically state
9 that economics or the cost of pollution control is not
10 here. It provides also that certain plants can be
11 excepted for national security reasons. I don't know
12 if that applies here to not. I am not sure whether arsenic
13 or copper is.

14 MR. SALO: Let me ask a follow-up question.
15 Did you say that you thought that we could interpret the
16 statute to require the standard to go as far towards
17 zero as technologically possible, as long as you didn't
18 consider economics?

19 (b) (6) : That's basically my position.

20 MR. SALO: May I ask why we can consider
21 technology, technological feasibility under Section 112
22 if we cannot consider economics?

23 (b) (6) : Because 112 refers to
24 technological feasibility. Certain hazardous air pollutants
25 cannot be controlled through technology and the work

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1 practices, then other factors may be considered but
2 economics is not mentioned in that, other than one short
3 section about monitoring the hazardous pollutant.

4 HEARING OFFICER: One thing that bothers
5 me, how do you determine whether something is feasible
6 if you don't include some economic factor. For example,
7 let's say that you could--it's possible to design a
8 system that might cost \$2 billion. It is technically
9 feasible in an engineering sense and no other system,
10 let's assume no other system could provide this ample
11 margin of safety but that, just as an assumption. Are
12 you saying that that is what the agency would have to
13 require or is there some economic factor, in other words
14 is there something--

15 (b) (6): Section 112 is fairly new and
16 its interpretation is fairly new and basically we
17 proposed regulations of that just now, as far as the
18 national policy is concerned but basically I am just saying
19 that, let's take this situation, for example, the local
20 leaders have decided that basically, based on one other,
21 sulfur dioxide emissions, basically they have to rebuild.
22 I don't know what kind of desulfurization system they
23 would consider but basically the local leaders have
24 decided that the plant has to rebuild and they can't
25 afford to rebuild, at least that's what the order says now.

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1 In making the 9-0 decision they insist that ASARCO
2 make that decision. But I am saying that it is kind of
3 hard to believe that throughout your position paper that
4 it is most deficient when local leaders have been with
5 this problem for 15 to 20 years, at least the last 13
6 years, to determine that economically their requirement,
7 to completely rebuild the smelter is not economically
8 feasible. I don't quite understand how the decision
9 making process was done at the EPA in determining that
10 they suggest this hooding, it is limited to that factor.

11 I am sort of getting off the subject but what
12 I am saying is that I don't think that you even have to
13 approach that theoretical mark, well legally.

14 HEARING OFFICER: You say you would have
15 to get to that?

16 (b) (6) : You don't have to get to that,
17 that's not the situation. What I basically recommend
18 is that the PSAPCA recommendation be adopted, the emission
19 standards and they will provide the implementation.
20 They've been at it for 13 years. They know the plant
21 inside and out. They've heard enough from citizen groups
22 and ASARCO to fall asleep with. Basically we're just re-
23 inventing the wheel.

24 HEARING OFFICER: Thank you. Any other
25 questions?

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(No response.)

HEARING OFFICER: Thank you, Mr. (b) (6).

Dr. Origenes?

HEARING OFFICER: Please state your name for the record.

DR. ORIGENES: My name is Maurice Origenes.

Ladies and gentlemen of the panel and fellow citizens: I originally prepared to talk to my fellow citizens as well so I will just proceed with what I have. I didn't bring any slides to the panel.

In a lengthy study or review of any problem it is worthwhile to do three things, review the speaker, or the writer or the authority, review the subject matter and review yourself. For you to be able to review me I will mention a few things about myself. I have practiced medicine for 30 years, a practicing pediatrician, sub-specializing in diseases and cancer in children. I have been here in Tacoma for the past 17 years. I was Chief Resident in Pediatrics at the Memorial Sloan Kettering Cancer Research Center and I have been associated with the Children's Cancer Study Group, National Cancer Institute since 1958. This year I have been scientific grant reviewer for community cancer grants for the National Cancer Institute.

I am very interested in students and the subject

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1 of carcinogenic emissions from the Tacoma smelter,
2 arsenic emissions from ASARCO.

3 I would like to review some considerations about
4 arsenic and its effect in humans. A direct relation of
5 arsenic alone, by itself, as an agent that produces
6 cancer in man is difficult to prove because of very many
7 variables in human subjects and numerous factors that
8 exist in human populations. Examples of these are
9 differences in genetic substitution, lifestyle, dietary
10 consumption, occupation, smoking habits, the age of the
11 person and families. There are findings that support the
12 hypothesis that inhaled arsenic is a respiratory carcinogen
13 in man but what is missed is the modifier that the
14 investigators place on that finding. There are other
15 influences, like sulfur dioxide or other unidentified
16 chemicals or agents occurring at about the same period as
17 arsenic exposure that cannot be discounted.

18 During this past few days and this evening
19 there have been particular concerns by people who do not
20 work in the Tacoma smelter but live around the environment,
21 in the community around the smelter. It is a valid
22 question for us, is there a connection between lung
23 cancer and community exposure with particular reference
24 to the Tacoma smelter. Well, let's look at the medical
25 literature.

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1 There are various and sundry numerous smelters
2 in this country and part of the panel knows this very
3 well and they may resent it but for the sake of my fellow
4 citizens, I will just proceed with what I have to say.

5 There are smelters in El Paso, Texas, Kellogg,
6 Idaho, ten smelters around Anaconda in Montana, New Mexico,
7 Salt Lake City, Utah and six locations in Arizona and
8 also a pesticide plant in Baltimore and a smelter in
9 Northland, Sweden which have been observed and studied
10 well.

11 Arsenic air pollution has not been shown to
12 produce high lung cancer rates in the study populations.
13 We have our own smelter in Tacoma to study and Dr. Sam Milham
14 Washington State Health Services Division has done marvelous
15 and exceptional studies in this area and he's found no
16 excess risk at the present time for lung cancer in
17 persons living near the smelter compared to the entire
18 population of King County or throughout the state of
19 Washington. He's also found that the children who go to
20 Ruston Elementary School, which is in the shadow of the
21 smelter, are not any more sick, do not have higher rates
22 of absenteeism and have no blood changes compared with
23 children in school not exposed similarly to arsenic.
24 This is a fact considering that Ruston children have higher
25 arsenic in their hair and urine than the control study

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1 groups. The Medical Records Departments of the hospitals
2 in our area give testimony in regard to harmful effects of
3 arsenic. I called the Medical Records Directors of nine
4 hospitals within a 20 mile radius of the Tacoma smelter.
5 I asked about a number of people, patients, who had been
6 discharged with the diagnosis of arsenic toxicity.
7 There was one child and this child had ingested dust.

8 The conclusion, there is no noticeable short-
9 term or long-term effect that one can find at the present
10 time due to arsenic in the Tacoma smelter in this community
11 in recent years.

12 There is one more important point to consider.
13 Arsenic in significant or toxic levels, who knows what
14 a toxic level is, will produce skin pigmentation of
15 selected areas of the skin, the neck, eyelids, nipples and
16 arm pits. The skin may be thickened in these areas.
17 There can be swelling and certain described edema,
18 especially of the lower limbs, face and ankles. There is
19 a garlic odor in their breath and body sweat, excessive
20 salivation and body sweating may occur. This may be
21 associated with nausea, vomiting or diarrhea. There can
22 be depression of the bone marrow.

23 I specifically asked Dr. Milham if he observed
24 any of these features in the children he studies who have
25 high levels of arsenic in the urine or other body specimens.

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1 His answer is no. And in my 17 years in Tacoma I have not
2 seen this phenomenon, a phenomenon I can ascribe to
3 arsenic.

4 Finally the third review concerns each one of
5 us individually as well as collectively as a community.
6 We have been emotionally upset over the smelter for very
7 good reasons as well as, perahsp, for no good reason.
8 A good reason is that we all wish to live in a clean
9 environment. I repeat, we all wish to live in a clean
10 environment! Let's not forget a fact that arsenic is a
11 common environmental element, smelter or no smelter. It
12 is in the soil and water and in the air and arsenic leaches
13 from soil and rocks and high concentrations in the
14 atmosphere. It is released drom coal during combustion.
15 Application of pesticides and herbicides containing
16 arsenic contributes to its environmental disbursement.
17 So fruits and vegetables sprayed with herbicides lead
18 to its ingestion and many species of fish from Maine,
19 New Orleans and Puget Sound concentrate arsenic. Man's
20 average daily intake of arsenic is about .9 to 1 mg.
21 almost all of this is ingested with food and water.
22 As the body burns the water, you and I could take an
23 average of about 20 mg. and do you think that is insigni-
24 ficant? You and I or anybody will never know the answer.

25 If one considers all the many other toxic elements

1 in our environment that are accumulated in the human
2 body that would cause injury to human organisms, you and
3 I would go psychologically crazy. With one element,
4 arsenic, many of us are already very upset. However,
5 there is one environmental toxicant that causes or
6 contributes to more than 150,000 deaths a year in the
7 United States. It is the number one cause of respiratory
8 congestion and bronchitis in the world. It is the number
9 one cancer killer of men. It is predicted to be the
10 number one killer of women, surpassing breast cancer,
11 in another decade. It is the number one cause of prevent-
12 able diseases in this country and this culprit is cigarette
13 smoke.

14 I am a doctor telling you there are millions
15 of more deaths and illnesses caused by or directly
16 associated with cigarette smoking compared to that produced
17 by arsenic and what are we going to do about it? What is
18 the EPA going to do about it? What is our community
19 going to do about cigarette smoking?

20 In conclusion, ladies and gentlemen, let us all
21 support just and reasonable standards for arsenic
22 emissions in our community. Let us support our Tacoma
23 smelter and its goal to achieve a better environment for
24 the worker and for the non-worker and let us not kill the
25 smelter with our unfounded and cancerous attitudes. Let's

1 adopt good and scientifically thought out environmental
2 standards.

3 Thank you.

4 HEARING OFFICER: Thank you, Dr. Origenes.
5 (Applause.)

6 HEARING OFFICER: Any questions for
7 Dr. Origenes?

8 MS. SMITH: Have you reviewed the records
9 of local hospitals?

10 DR. ORIGENES: I reviewed the charts that
11 had certain diagnoses and the record of those that I
12 asked for of non-workers.

13 MS. SMITH: How did you find what arsenic
14 toxicity was?

15 DR. ORIGENES: Signs of arsenic toxicity
16 was shortness of breath, nausea, vomiting, abdominal pain,
17 if one had blood emolysis of hemoglobin area.

18 MS. SMITH: The question I was getting at,
19 were there subtle symptoms that may not have been picked
20 up by the records, is that correct?

21 DR. ORIGENES: That is correct. Many
22 people running around may have more than the average,
23 maybe even what one may consider toxic levels and are well,
24 that is what the human organism does. It can stand a lot
25 of battering and still work well.

1 MS. SMITH: I just have one other question.
2 Do you have any feel for what extent, the epidemiology
3 studies that have been done, like what percentage of
4 cancer you might have to have to be able to detect it?

5 DR. ORIGENES: That is not a very easy
6 study to undertake. When you deal with numbers you know
7 that there is not an increased incidence of lung cancer
8 around the Tacoma smelter, we know that for sure from
9 records, the records that we have. But risks or arsenic
10 levels, that is very, very difficult to determine.
11 I don't know if that answers your question.

12 MS. SMITH: Well, my point was that there
13 may be some cancer that you might not detect in epidemio-
14 logical studies. Did you take that into account?

15 DR. ORIGENES: At least those studies
16 around smelter communities have not shown any evidence
17 yet. That doesn't mean that it isn't there.

18 HEARING OFFICER: Any questions?

19 MR. SALO: Yes, are you familiar with
20 the health assessment document that the agency has done
21 are arsenic as far as the record on this ruling?

22 DR. ORIGENES: I don't think I'm familiar
23 with the document.

24 MR. SALO: Well, let me put the question
25 differently. Are you familiar with the agency's approach

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1 of looking at occupational studies showing occupational
2 exposures to arsenic causing lung cancer and then
3 extrapolating from that, concluding that lower exposures
4 may well also produce some cancer. If you are familiar
5 with that, would you comment on that approach?

6 DR. ORIGENES: I did make reference to the
7 fact that, yes, there is a definitely higher cancer risk
8 to smelter workers. I think extrapolating that to the
9 community, we do not really know whether the body
10 specimen samples from the workers, I don't know how their
11 levels compared to those of the population who did not work
12 in the smelter. It is probably a valid thought. I know
13 we could make a lot of guesses but we can't be sure.

14 MR. SALO: You're saying a reasonable
15 person cannot anticipate that ambient exposures to
16 arsenic can contribute to lung cancer?

17 DR. ORIGENES: It is very difficult to say.
18 There are many other factors involved.

19 HEARING OFFICER: Any other questions?

20 (No response.)

21 HEARING OFFICER: Thank you, doctor.

22 (b) (6) ?

23 (b) (6) : I have a small example that
24 I want to show you. This is a photo of Vashon Island
25 and this will be what we will discuss and what I am going

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1 describe.

2 This is a Xerox of what is down there. Can you
3 see that photograph or is it turned in the wrong
4 direction?

5 HEARING OFFICER: Please state your name
6 for the record.

7 (b) (6): Yes. My name is
8 Judith Lawrence and I was born, well I'm second generation.
9 My grandparents came here in 1886 from Norway. I was
10 born in Seattle and I was raised just past this first point
11 here on Vashon Island which is called Alki Point. If you
12 went around the next point, you would be going to the
13 Harbor of Seattle and I have lived almost all my life in
14 Seattle and I now live on the very north end of Vashon
15 Island on (b) (6).

16 I want to discuss the subject of pollution
17 stress. When we are dealing with the smelter, I can't
18 help but be a northwesterner and real Puget Sounder and
19 not be aware of pollution stress. What it means to me
20 is I marked there on that little map for you is we're
21 not only dealing with the smelter, we've got land, air
22 and water pollution all around us on Vashon Island and,
23 being Puget Sounders, we have Commence Bay which some people
24 say is the dirtiest port, it's 11th or 12th or 15th or
25 whatever. Water pollution is coming at us daily. As

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1 you can see, Commencement Bay is up by the north or
2 top of that and anything that filters into the water
3 comes all the way around Vashon Island. The tide goes
4 in and out two times a day and it goes out four hours
5 or five or six hours, and comes in five or six hours.
6 If you got into your sailboat and you sailed at a medium
7 speed from Tacoma, it takes you five hours to get to the
8 north end of Vashon Island; it takes you 20 hours by
9 medium sail to go to Anacortes, so I hope that gives you
10 the picture. It doesn't flush out like they think it
11 does.

12 We're dealing with Commencement Bay, we're
13 dealing with the Metro Sewage which have also had their
14 paperwork here, the City of Seattle wants to, on the
15 far right hand when you see those green lights on the
16 left-hand side, want to take an 8-foot diameter pipe
17 200 feet below the water and shoot in hard metals, so
18 they call it "treated effluent" but it's stuff from
19 Sea-Tac Airport, from the industrial area over by Boeing.
20 They spend millions of dollars to shoot this sewage
21 out into the sun.

22 We've got air pollution. We've got the Seattle-
23 Tacoma Airport coming in and out 24 hours a day and also
24 right now they want to reroute their planes and send them
25 over Vashon Island.

1 The water is a closed environment in the sense
2 that the tide goes in and out just those few times
3 and Vashon Island on the West side, which is this side
4 here, we've got sea otters. We have caves there and we
5 have sea otters, river otters. There an old guy
6 up there that lived there for 83 years and he keeps
7 people off his property and out of his creek with a
8 gun. He respects his tidelands and he protects the
9 river otters going up and down. Two little baby ones
10 this summer he had. We have Orca Whales off the north
11 end of Vashon. You can catch salmon; we caught six
12 in 24 hours off the end of North Point on Vashon Island.
13 But we've got the red tide.

14 Many times this summer we sailed up to the
15 San Juan Islands and there was red tide all the way up,
16 all the way up into the Canadian San Juan Islands.

17 Just a few things more. My suggestions is
18 if you as the EPA would like to close this thing to really
19 strong environmental effort, someone has come here and
20 gives us some kind of power other than just things we
21 really care about. Commencement Bay--well, I'm not
22 against the smelter. I'm not against the paper and pulp
23 mills. We need all these things. We need industry.
24 They've been here since the turn of the century and this
25 is 1983 and some of their methods are pretty primitive.

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1 Once there were hardly any roads on Vashon Island
2 and now we've got about 9,000 people there. In 83 years
3 we are dealing with a lot of pollution stress. We're
4 dealing with pollution by air, land, sea and water.
5 Some of it you can see and some of it you can't see. We
6 have the airplanes coming at us all the time. You can't
7 do anything about that. Why don't they route the
8 airplanes over the water. I know they don't have to fly
9 over the land. We've got a lot of water here in the
10 Puget Sound. Those planes don't have to go over Vashon,
11 they could fly over water. We electron microwave towers,
12 we have six of those on Vashon Island now. They are
13 reaching satellites so we can get better telephone and
14 electronic kind of communication power but where do they
15 put them, they put them on the island right near the
16 residential homes. It happens that the radio stations
17 own the land. They've got 160 acres so they get to put
18 them there. Well, we on the island tried to fight this
19 thing. We go to the county, go to the meetings but the
20 towers are built. 60,000 watts and concrete they put
21 before they make the tower. Those things are really
22 harmful. They beamed them south. We're worrying about
23 the smelter coming at us. The people in Tacoma should be
24 worrying about the electromagnetic microwaves coming at
25 them every hour of the day. Pollution stress, the kind

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1 the kind you can't even see. The Metro Sewer, maybe
2 you could do something about those people. They could
3 filter the stuff and recycle it. They do it on the East
4 Coast, I've read, instead of shooting it in the water,
5 maybe they can put it on land somewhere and recycle it
6 and use it for landfill. They could have plants and big
7 ponds. At least it would be better. I have this visual
8 cartoon in my head of the fish and the clams and everybody
9 down under the water crying "help" as the stuff comes
10 out of that tube. Millions of dollars they are going to
11 spend on that tunnel. They're human moles. They ought
12 to think about using the sewage, doing something with it.

13 As regards the smelter, if you are going to do
14 anything, do the pollution control devices. Something
15 can be done obviously. Around this port and in the lower
16 Sound, it means survival for all of us, for boaters, for
17 fishermen, for all of us. We have the lumber industry,
18 we have all these people growing plants, people growing
19 seaweed right across from where they are going to put the
20 sewer pipe. They've all been there a long time. It
21 means survival for some of us, economics for others,
22 but there is obviously a way, with all the power that you
23 have, that maybe you can at least do something about it.

24 I would hope that the EPA, which is a national
25 power, would realize that the lower Puget Sound is a

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1 closed environment and it doesn't filter as fast as
2 it would appear.

3 Thank you for listening to me. Thank you for
4 your time and attention.

5 HEARING OFFICER: Thank you.

6 (Applause.)

7 HEARING OFFICER: Do any members of the
8 panel have any questions of (b) (6) ?

9 (No response.)

10 HEARING OFFICER: Thank you.

11 The next speaker is Robert Lane, is that correct?

12 DR. LANE: My name is Robert E. Lane, M.D.

13 I am here on behalf of the Medical Society of Pierce County.

14 The Medical Society appointed a special committee
15 to review the available scientific evidence on the health
16 effects from exposure to arsenic, specifically in relation
17 to the Tacoma ASARCO Smelter.

18 It is clear that arsenic causes an increased
19 level of lung cancer in smelter workers. There is also
20 good evidence of other adverse health effects from arsenic
21 in these workers.

22 The health effects of arsenic from the smelter
23 on this community cannot be answered as clearly. Although
24 blood and urine samples of arsenic from children near the
25 smelter have been found to be much higher than samples
from children far away from the smelter, the Ruston

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1 children show no signs of illness at this time. In spite
2 of the fact that emissions of arsenic from the smelter
3 stack have been markedly decreased over the past ten years,
4 the urinary level of arsenic in children has remained about
5 the same. The degree of correlation of cancer and other
6 disease rates with arsenic levels around the smelter has
7 not been conclusively defined and more investigation is
8 needed.

9 The situation should be considered analogous to
10 health problems encountered with asbestos, smoking and
11 radiation exposure where the resultant ill effects were
12 not conclusively determined until after a long latent
13 period. Since a known carcinogen, arsenic, is being
14 emitted, the smelter should bear the major burden of proof
15 that the emissions are not seriously jeopardizing the
16 health of local residents.

17 In addition, we recommended that the Environ-
18 mental Protection Agency adopt a clearly safe community
19 standard for the airborne emission of arsenic based on the
20 occupational ambient air standards already set by the
21 Occupational Safety and Health Administration, OSHA.
22 This standard should be considerably less than the
23 occupational standard because community exposure is 24
24 hours a day, rather than an 8-hour work day. A level of
25 one microgram per cubic meter should provide a margin of

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1 safety for the community. We offer these recommendations
2 in order to protect the health of the population we
3 serve.

4 Thank you.

5 HEARING OFFICER: Any questions of
6 Dr. Lane?

7 MR. O'CONNOR: Was the 1 microgram a
8 daily average?

9 DR. LANE: Yes.

10 HEARING OFFICER: Any other questions?

11 (No response.)

12 HEARING OFFICER: Thank you.

13 The next witness to be called is (b) (6).

14 Is (b) (6) present?

15 (b) (6): My name is (b) (6).

16 I work at the Tacoma plant of ASARCO in the carpentry
17 shop. For approximately 14 years I served in the
18 United States Army, I served in the Air Force as an
19 enlisted man. I've served as an officer. I've served
20 stateside and I've served overseas. It may take me a
21 little while to get the information out that I would like
22 to present this evening.

23 I have a tremendous dislike for President Reagan.
24 He fired one of my sons who is an air traffic controller.
25 He is a Vietnam veteran and he served in the Coast Guard

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1 for four years. I had a tremendous dislike for
2 approximately 3 to 6 months. I like the economic policies
3 of President Reagan in general and I like the military
4 policies of President Reagan very much. I believe the
5 products that the ASARCO smelter produces are very
6 essential for the national defense of our nation. I
7 believe the ASARCO smelter should be kept open if at all
8 possible because of national defense reasons.

9 I thank you.

10 HEARING OFFICER: Thank you, (b) (6).

11 Any questions from the panel?

12 (No response.)

13 HEARING OFFICER: Thank you (b) (6).

14 (Applause.)

15 HEARING OFFICER: The next witness to be
16 called is (b) (6).

17 (b) (6): My name is Steve Jacobson
18 from West Coast Smelters. What is your title?

19 HEARING OFFICER: I am the Hearing Officer.

20 (b) (6): And how did you get the job?

21 HEARING OFFICER: I applied for the job.

22 (b) (6): And what kind of a background
23 do you got?

24 HEARING OFFICER: I am a lawyer.

25 (b) (6) And what is your name and

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1 title?

2 MR. O'NEAL: I am Gary O'Neal, from the
3 Environmental Agency.

4 (b) (6): What does that cover?

5 MR. O'NEAL: That's technical studies
6 investigation.

7 (b) (6): How did you come to be
8 that?

9 MR. O'NEAL: I went to college and
10 studied for it.

11 (b) (6): And what is your title?

12 MR. SALO: My name is Earl Salo and I am
13 with the EPA.

14 (b) (6): And how did you get that?

15 MR. SALO: I went to law school and
16 applied for the job.

17 (b) (6): So you went to school.

18 MR. SALO: I am an engineer also.

19 (b) (6): I worked out at the smelter
20 16 years and grew up within a mile and a half radius of
21 the smelter. I don't think there is any problem and I
22 want to know what is going on. Why is there a problem?

23 HEARING OFFICER: (b) (6), if I could
24 explain to you. This is a hearing where we're supposed to
25 listen to you. I don't want to argue with you but we have

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1 the EPA has made a proposal in writing and we are here
2 today to listen to you. If you want to tell us how you
3 feel about it, the proposed controls of arsenic emission
4 on the facility, ASARCO, please tell us about that.

5 (b) (6) : First of all, I haven't
6 been to college like you have so I don't have the under-
7 standing that you do of what it's all about but I don't
8 see that there's any problem.

9 HEARING OFFICER: Well, that's important
10 for us to hear.

11 (b) (6) : Now wait a minute--

12 HEARING OFFICER: I'm not going to argue
13 with you. I just want to hear from you.

14 (b) (6) I don't want to argue with
15 you at all but how can I argue with somebody that's been
16 to college. How can I tell you, here I am two days out
17 of high school, and I'm working at the smelter, how am I
18 going to tell you what life's all about.

19 HEARING OFFICER: (b) (6) , what
20 we're interested in is what you observed and what you
21 believe.

22 (b) (6) : I believe there's no problem.
23 My whole family and everything grew up around the smelter
24 and I don't see any problem at all. I don't know how
25 I can tell you what life's all about when you've been to

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1 college and I haven't.

2 Now wait a minute. If there was a problem, I
3 wouldn't be working there. My health and my life means
4 a lot to me, and this body. If you abuse your body,
5 where are you going to live? I don't have anyplace else
6 I'm going to live. My life means a lot to me and if I
7 thought there was a problem, anything wrong, I wouldn't
8 be there. That's the way I feel about it. And, ma'am,
9 I'm talking to you too. I don't think there's any
10 problem at all. There is nothing I can say to any of you.
11 You've been to college.

12 HEARING OFFICER: The fact that we've been
13 to college isn't important. We want to hear from you,
14 what you observed and how you feel.

15 (b) (6) : Now you're like God up
16 there, you guys are above me, and I'm standing down here.
17 How can I--what does my reaction mean to you? What does it?
18 It doesn't mean anything, does it?

19 HEARING OFFICER: It is important that we
20 hear from the public as to how they feel and what the
21 problems are. You're telling me that you don't have a
22 problem and that's important, that piece of information.

23 (b) (6) : If I thought I had a problem,
24 I wouldn't be down there. I don't think I have a problem
25 at all but also I wonder how I can sit down here. You've

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1 been to college, all of you have been to college.
2 You're talking about being lawyers and everything. I
3 haven't been to college. I don't have a degree at all.
4 Two days out of high school I went to work at the smelter.
5 Why does my input to you mean anything. You have doctors,
6 you have lawyers and everything else here talking to you.
7 What am I?

8 HEARING OFFICER: I can't tell you. I
9 can only listen to you as to what you have to say.

10 (b) (6) : I don't think there is any
11 problem at all.

12 HEARING OFFICER: I understand.

13 (b) (6) : What does that mean to you
14 though?

15 HEARING OFFICER: That means that you don't
16 have any problem. That is a piece of information. We
17 have to take your information along with all the other
18 pieces of information we can get.

19 (b) (6) : So if I came here with a
20 whole book of things, tell you about my parents and
21 that my dad grew up down there and everything else, my
22 whole family went through there all the years, that would
23 mean something to you?

24 HEARING OFFICER: If very well may.
25 Thank you for submitting that information.

1 (b) (6) : My dad worked there 43
2 years. I went to work down there and I've been there
3 16 years. There's nothing wrong with me. I've grew up
4 here. I've seen the changes down at the smelter. You
5 wouldn't believe it. I tell you what, I'll take anyone
6 on, no problem. I feel good and I feel happy and I like
7 my job. I like the smelter. There's no way I'll ever
8 change my life. I've been there and I don't think there's
9 any problem. Also there are big changes being made
10 because they are doing changes and I think it is all
11 pretty good.

12 HEARING OFFICER: Thank you, (b) (6) .

13 (b) (6) : You're welcome.

14 (Applause.)

15 HEARING OFFICER: Any questions for

16 (b) (6) ?

17 (No response.)

18 HEARING OFFICER: Thank you.

19 (b) (6) ?

20 (b) (6) : My name is (b) (6) .

21 I live on Vashon Island within the 20 kilometer radius
22 that has been drawn around the ASARCO smelter. I feel
23 that our views as Vashon Islanders have been adequately
24 presented by representatives of the Vashon Community
25 Council and other citizens of Vashon.

1 I would like to focus my comments specifically
2 on the validity of the mathematical dispersion model with
3 EPA is using as the basis for determining exposure
4 estimates in their risk assessment of residents living
5 within the range of the ASARCO smelter's aerial arsenic
6 discharge.

7 This model was explained to the Vashon public
8 at the EPA's August 10th workshop held on the island.
9 Mr. Robert Ajax of EPA's Washington D.C. Air Quality
10 Standards Office showed us a slide show, with very neat
11 and colorful graphs which illustrated the dispersion of
12 ASARCO arsenic as predicted by EPA's computer model.
13 The dispersion curve which Mr. Ajax presented to the
14 residents of Vashon showed arsenic levels diminishing
15 along a smooth curve as distance from the smelter increased.
16 The graph of his model was suspiciously smooth. It
17 in fact looked like a textbook decay curve, typical of
18 the way many physical and natural systems behave in the
19 ideal world. That is a world without terrain, rain,
20 dynamite stack cleaning, or the many other variables which
21 effect who finally ends up breathing or eating how much
22 arsenic in the drizzily real world, downwind of the
23 ASARCO smelter.

24 One real advantage to methmatical models of the
25 type which EPA is using in its "risk assessment"

1 determination is that you can take that ideal world of
2 the model back to your office in D.C. and avoid a lot of
3 slogging around in the field collection actual, empirical
4 samples of arsenic levels. Who wants to have to touch the
5 damned stuff anyway?

6 I feel that Mr. Ajax made a misleading representa-
7 of the dispersion model to the people at the Vashon work-
8 shop. Of what predictive value is the EPA model in the
9 real world in the shadow of the smelter?

10 Mr. Ajax admitted that the model needed a lot
11 of work. He told us that, as of August of '83, his
12 standards group had tested the model with two actual field
13 measurements of arsenic and these points were, and I quote,
14 "off by a factor of fifteen times" from what the model had
15 predicted. He implied that, because these points fell
16 well below the classic exponential curve of his model,
17 that the model was conservative and exposure values were
18 probably much lower than the model predicted throughout
19 the 20 kilometer study area.

20 What the only two ground-truth points of data
21 being off the graph by a factor of 15 times indicates to
22 me is that it is not a very good model at all. Very
23 probably the real world dispersion curve, if we could put
24 it on paper, or a flashy slide, would look as jagged as
25 the Olympic skyline does from the Vashon ferry some clear

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1 mornings, and a lot less like a graph of the ideal gas
2 law. There are effects of terrain, meteorology,
3 patchiness of discharge from the stack and hundres of
4 other variables which make that ideal particle of arsenic
5 twist and turn over the Sound and countryside so unpredict-
6 ably that our best model is only as good as the field
7 monitoring data we use to adjust it to the real world
8 situation.

9 At the risk of sounding pedantic, I would like
10 to share with you some of my misgivings about the world
11 of high technology. There is a tendency for us to
12 believe that if they are using a computer model, the EPA
13 standards people are using the, to borrow a familiar
14 phrase, "best available technology" for their studies of
15 arsenic dispersion from the ASARCO smelter. Perhaps
16 you've heard the old saw often seen in the computer world
17 abbreviated G.I.G.O. What a machine can tell you is only
18 as good as the programs and data that humans can provide
19 for it. We cannot expect a computer to extrapolate
20 inductively for us when we have given it very little to
21 work with.

22 Perhaps a model of a model is a good ballpark
23 way to look at the situation. Say that we are trying to
24 predict how billiard balls will be distributed in the
25 pockets of a pool table at any particular point in the

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1 in the game. We can use an idealized model which looks
2 mathematically at how the balls behave when the collide.
3 There are some fundamental, immutable laws of physics
4 we can use in our calculations which could be used at
5 any instant in time to make a prediction. Now play that
6 game on the deck of the Tacoma ferry in twenty knot
7 winds with a good sea running and the felt on the pool
8 table ripped up a bit and see what good that model does
9 us. What we can do is count the balls in each pocket as
10 the game progresses. In my bood this is a better technol-
11 ogy to describe what's happening in a system with an
12 almost unlimited number of variables than the mathematical
13 approach. Using the two techniques together might be
14 the best way, or, depending on the validity of the
15 mathematical model, it may not. The model to be adjusted
16 towards the real situation.

17 What disturbs me the most about EPA's heavy
18 reliance on the dispersion model in their risk assessment
19 formulae is that, at this late date, there is such a
20 paucity of field monitoring data on arsenic from ASARCO
21 to use in any model. Why has this been neglected and why
22 has so much confidence been placed in a free-floating
23 dispersion model? I understand the constraints which
24 the court order puts upon EPA in terms of time, but I
25 see no provision for timely review and change in the

1 standard as exposure levels in the field are monitored
2 with superfund monies and we come closed to an understanding
3 of the real exposure levels responsible for elevated
4 urinary arsenic, et cetera.

5 In closing I would remind you that there were
6 hearings not unlike this one held for Times Beach or
7 Love Canal where jobs were pitted against environmental
8 protection. There was certainly some testimony about
9 healthy old folks who lived their lives near the factories.
10 Like the thousands of unfortunate people who were unwitting
11 victims of industrial pollution in those towns, we are at
12 risk of realizing too late that we are guinea pigs in a
13 poorly designed experiment in which the control group is
14 already dead.

15 I would like to thank the EPA for presenting
16 us with the educational workshop on Vashon Island and I
17 would like to see more public information events like
18 that to explain the workings of the EPA. It was encouraging
19 to see.

20 HEARING OFFICER: Thank you (b) (6) .
21 Do any members of the panel have any questions.

22 MR. O'NEAL: I understand the one
23 suggestion you are making is that a provision be made
24 as more data becomes available to modify the calculations,
25 to modify the official predictions?

1 (b) (6) : I am not aware of any
2 current art of current EPA plans to review the validity
3 of the information that the decision is made upon.
4 For instance, the validity of the model, either the
5 health model which I speak to tonight or the dispersion
6 model which determines pretty much what the exposure
7 rate factor is in considerations of the risk assessment
8 as I understand it.

9 MS. SMITH: My valid, do you mean have
10 ambient air models?

11 (b) (6) : Yes, ambient air models
12 which superfund does not provide now will be provided
13 as more data is put into play and used.

14 HEARING OFFICER: Any other questions?

15 (No response.)

16 HEARING OFFICER: Thank you.

17 (Applause.)

18 HEARING OFFICER: (b) (6) ?

19 (b) (6) : My name is (b) (6) and
20 I am a physician assistant and I speak as a health provider
21 in this community and also as a resident of Vashon Island.

22 The EPA is mandated by the Clean Air Act to
23 set emission standards for hazardous pollutants at a
24 level which provides an ample margin of safety to protect
25 the public health. Because there are relatively few

1 sources of a chronic level arsenic emissions worldwide,
2 broad-based epidemiological studies on the ill effects of
3 arsenic emissions are not available. We do know arsenic
4 is fatal and lesser amounts are known to cause skin and
5 lung cancers. It is hard to comprehend why an element
6 with such known toxicities, why the EPA has proposed such
7 liberal standards and how they can determine with current
8 information that any exposure from grade zero level
9 does provide an ample margin of safety.

10 The EPA was established to protect the
11 environment and in the first few years of its existence
12 it appeared to be trying to do just that. In the past
13 three years however we have witnessed the demise of the
14 EPA from its public responsible role and it now appears,
15 at least in the past three years, to be following the anti-
16 environmentalist sentiments of the current administration.

17 I feel these hearings are an extension of that
18 lack of political autonomy. While I am most grateful for
19 the opportunity to present my views and appreciate the
20 EPA's activities and efforts to educate the public on
21 the proposed arsenic emission standards, I feel that if
22 the EPA were to return to its original goal as an
23 independent governmental agency established to monitor
24 and protect the environment, such public hearings would not
25 be necessary other than in the form of technical forms of

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1 conferences.

2 The issue of arsenic emissions from the ASARCO
3 smelter has been presented by the media as a choice between
4 jobs versus the environmentalists. To balance health
5 for jobs presents an unfair choice on that premise and
6 that places those concerned about potential health
7 effects in a position akin to that of a criminal who is
8 assumed to be guilty until proven innocent. The EPA
9 is establishing exposure levels without adequate research
10 into health effects. If further findings are brought
11 forth, they will enforce further reductions but what of
12 the health of those caught in between and the detriments
13 on their health.

14 Premise number two, to present the issue as
15 health versus jobs places the blame for ASARCO's eventual
16 closure on those concerned for the health effects and
17 it removes the culpability for plant closure from the
18 employer, ASARCO. ASARCO has polluted this area for more
19 than 90 years. They have consistently resisted emission
20 controls for as long as possible and have threatened
21 closure at least twice before. Are they accountable
22 again? Are they not the ones who should not be ultimately
23 responsible for ensuring the continuation of the jobs
24 in this community and are they not responsible for the
25 health of their employees and for those living in the

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1 neighborhoods surrounding the plant. Economic evidence
2 has been presented by members of Vashon's community to
3 document ASARCO could indeed potentially afford to install
4 cleaner and more efficient smelting processes other than
5 those currently in place. This would no doubt temporarily
6 reduce profit margins but should not result in a closure
7 of the plant.

8 In conclusion, I would ask that the EPA change
9 its proposed arsenic standards to further reduce the
10 maximum allowable arsenic emissions and I would ask that
11 it revise its definition of "best available technology".
12 If current standards are maintained as proposed, I would
13 ask that funding be provided for an epidemiological study,
14 control study populations of sufficient numbers to yield
15 significant data and with questions designed to reveal
16 other potential medical problems other than cancer
17 incidence. I would ask that monitoring of hair and
18 urinary arsenic levels be provided to any persons desiring
19 that service. I would ask that further and broader
20 studies of arsenic and other heavy metal contaminants
21 in the soils surrounding ASARCO in a 12 mile radius be
22 carried out such as that which has already been partially
23 done through the King County Public Health. I would ask
24 that there be initiation of a survey of arsenic and heavy
25 metal pollutants in shellfish and bottom fish in the local

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1 areas around here. It concerns me when I come over on
2 the ferry to see people fishing off Point Defiance Pier.
3 I would ask that more thorough and constant monitoring of
4 airborne arsenic emissions be carried out. I would ask
5 that epidemiological study conducted through local
6 veterinarians survey animals for cancer and other possible
7 health effects. A veterinary on Vashon last night
8 mentioned that she had seen more cancers than she had
9 ever seen in her life and higher instances of arsenic
10 effect that she would have expected in the population of
11 Vashon. There should be an epidemiological study of
12 women living around the smelter or near the smelter
13 designed to see if there is any evidence of miscarriages.
14 That statistic was found in a study of women smelter
15 workers in Sweden. This effect hasn't been brought up
16 at all during this hearing as far as I know, at least
17 during the workshops. And I would ask that complete
18 economic risk assessment be carried out on the issue.
19 This includes reimbursement for cancer, reimbursement for
20 any other ill effects, reimbursement for the consequences
21 of unemployment, if that happens, the effects of
22 economics, the effects of screening programs and
23 economic effects of decreases in property values in the
24 areas around the smelter and I would ask that there be
25 continuation of the study of Dr. Bromecek on Vashon,

1 that there be more studies and more funding.

2 Thank you for the opportunity to give this
3 talk. Any questions?

4 (No response.)

5 (Applause.)

6 HEARING OFFICER: Thank you. The next
7 witness is (b) (6) . (b) (6) ?

8 (b) (6) : My name is (b) (6) and I
9 thank you for this opportunity to present my views. I
10 will be brief about them. I live in Tacoma, within a
11 few miles of the smelter, and I have watched with some
12 helplessness the repeated scenario of the rise in public
13 concern with the smelter's emissions followed by agency
14 and court actions and the continued procrastination by
15 the smelter to comply with the standard.

16 Frankly, I feel we have just simply let them
17 go too far. I am convinced that the smelter's risk to
18 our health is real and do not attend to accept any absence
19 of evidence of health hazards to be conclusive confirma-
20 tion of the safety of the air, water and soil. I also
21 recognize that the smelter's products are valuable to us.
22 Let's face it, when we wire our houses for electricity,
23 of course we want copper. My point is, I think we enjoy
24 these comodities at an artificially low cost and I feel
25 that the cost of production should include safeguards

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1 for the workers' health as well as appropriate handling
2 of the waste associated with the process that will assure
3 the quality of the environment in years to come. I am
4 willing to pay these extra costs; it is worth it to me
5 to insure clean air and soil return to Tacoma.

6 I urge you to follow through with the proposal
7 of the installation of the hoods to control the stack
8 emissions and further, to place responsibility upon the
9 smelter to comply with clean air standards, regardless of
10 the source of the emissions within the plant.

11 It is not my point here to present any more
12 technical testimony. I am sure by now you've heard the
13 facts in many forms. I simply just want to go on record
14 as a concerned citizen of Tacoma who is in favor of clean
15 air and put it shortly to the smelter people, I think
16 the people of Tacoma will take their noses out of the
17 smelter's business as soon as they take their business
18 out of our noses.

19 Thank you.

20 (Applause.)

21 HEARING OFFICER: Do we have any other
22 witnesses here?

23 (b) (6) ?

24 (b) (6) : My name is (b) (6) .

25 I am a student of public health at the University of

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1 California at Berkeley. I come here tonight to plead
2 for the children, to plead for the fetuses. There have
3 been so many times we've been promised that there is no
4 danger. We were promised that with the nuclear power
5 plants. We were promised that with above and underground
6 tests. We've been promised that by many corporations,
7 including ASARCO, that there is no danger. The fact
8 is that fetuses, newborn and children are particularly
9 vulnerable to many things, including the affects of arsenic
10 toxicity and it often takes time to gather data to
11 document its effects.

12 No one disputes that ASARCO is currently
13 contaminating the environment with arsenic. I believe
14 the evidence shows that air contamination with arsenic
15 emissions is injurious to health. Not only do several
16 studies show increased risks of lung cancer associated
17 with airborne arsenic emissions but high levels of arsenic
18 have been found in the air and urine of children as far
19 away as Vashon Island. We have already heard testimony
20 about that.

21 The National Academy of Science in its report
22 called "Drinking Water and Health" has concluded that our
23 present levels of protection for arsenic "may not provide
24 an adequate margin of safety." As mentioned, fetuses
25 are particularly vulnerable to arsenic toxicity. Research

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1 has shown that arsenic, in the form of sodium arsenic,
2 is dramatically teratogenic in mice and hamsters after
3 a single dose of 15 to 20 miligrams per kilogram of
4 body weight. By analogy with other teratogens,
5 it is highly likely that human fetuses will be substantially
6 more sensitive.

7 Are we willing to risk grave harm to our
8 children and our unborn children in order to preserve
9 the rights of officials and employees to choose how much
10 toxicity they are willing to accept in order to keep
11 the smelter open? It ought to be possible to preserve
12 jobs as well as the health of the children and the
13 fetuses and the newborns. The most important thing is
14 preventing harm, as was pointed many years by Hippocrates.

15 I would also like to point out that there is
16 another danger here. According to CFR 40 which is based
17 on the Geneva and Nuremberg Codes, human subjects must
18 be prevented from involuntary or uninformed exposure to
19 harm. If the EPA is not very careful to make sure that
20 the strictest possible standards are present here to
21 prevent harm, this would be like the EPA sanctioning
22 an epidemiological research project by exposing newborns
23 and fetuses and neonatals to uncertain risks and then
24 afterwards documenting the results. This would violate
25 the guidelines of CFR 40, the Geneva and the Nuremberg

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1 Codes. What made these experiments on human subjects
2 at Nuremberg morally reprehensible, among other things,
3 was that they were performed under conditions of undeniable
4 coercion which made voluntary consent impossible. I
5 would submit that the employees of ASARCO are legitimately
6 afraid of losing their jobs and many persons in Tacoma
7 are legitimately afraid of the economic impact to their
8 community if the ASARCO smelter should close and are
9 therefore being coerced by the threat of closure. This
10 makes truly voluntary consent impossible. Employees
11 should be given public support and assistance if ASARCO
12 decides to close, and of course, we hope that it will not,
13 but these fears, employees' fears of losing their jobs
14 cannot dictate public policy because truly voluntary
15 consent is not possible here.

16 We have no right to expose people who cannot
17 choose, they do not have voluntary consent in this, and
18 I would suggest that newborn children, neonats cannot
19 choose and we have a particular responsibility to protect
20 them from any kind of harm.

21 HEARING OFFICER: Thank you (b) (6).
22 (b) (6): I have some written testimony
23 which I will submit.

24 HEARING OFFICER: Thank you.

25 (b) (6) ?

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1 (b) (6) : My name is (b) (6) .

2 I am retired from the smelter some 5 years. I worked
3 at the smelter for 30 years, about 10 or 12 years in the
4 arsenic plant and ten years or so in the refinery,
5 ten years or so. I don't think the arsenic ever hurt me
6 to any extent so therefore I will go on to other things.

7 The smelter always gives sufficient time for you
8 to take a shower before you went home. The manager
9 one time I remember him saying that the men were quite
10 clean when they went out of the smelter. Today I will
11 have to disagree with some of the pollution control devices
12 that men have to wear in the smelter because from what
13 they say when I talk to them since I've left there, they
14 could run into a post or something like that with their
15 head completely covered up.

16 I worked in the arsenic plant wearing a resp-
17 erator cloth over my face. I don't have a hole in my nose,
18 I kept myself clean and most of the cases in the smelter
19 where you will find there was cancer, you will find that
20 the man was a heavy smoker or drinker. Not many people
21 have died in the smelter with cancer, although there's
22 a lot of people have died there. I know one man that
23 blamed the cancer on being in Japan when they dropped the
24 atomic bomb. So therefore I don't know one way or the
25 other, but then, while I had a heart attack four years ago,

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1 I don't feel it was caused by the smelter because in
2 talking to my aunt, she said that most all of my relatives
3 on my mother's side passed away in their late 50's and
4 real early 60's, so therefore I couldn't say that the
5 smelter is the cause of my heart attack and stroke. I
6 live within one-fourth mile of the smelter's smoke stack.
7 I have lived in the vicinity of the smelter for the past
8 30 years. I have raised three children and they show no
9 ill effects. They live within a mile of the smelter.
10 I've raised vegetables and eaten them. We have 10 fruit
11 trees and we eat that fruit.

12 I've heard people say that grass won't grow here.
13 Grass will grow there or anywhere that someone takes
14 care of it. I can grow grass. At the smelter where they
15 have barren land, all they need is a little water and a
16 little fertilizer. Most of our area is clay soil and it
17 doesn't warm up so therefore our fruit and our vegetables
18 will not grow as rapidly unless you do something to make
19 them grow a little faster.

20 I believe that automobiles are the big polluters
21 in our area. When I went to work at the smelter 30 some
22 years ago, you could look at Mt. Rainier almost any day
23 it was anywhere near clear and not cloudy and see the
24 mountain. Today you see a haze. And the water front
25 at that time was complete saw mills up and down and I

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1 wouldn't say they were the cleanest or the uncleanest
2 thing in the country but I would like to say one thing,
3 that unless we do something about the automobiles in this
4 country, which I've heard no one say anything about,
5 and we do something about the people living 30 miles or
6 10 miles or something like that away from their work,
7 you're not going to have anything but pollution. You
8 can close down everything in the country but until
9 people quit traveling so far to go to their work, there
10 will be end to the pollution. Until that time, until
11 pollution control takes care of the automobiles and people
12 living away from their work, we won't be able to clean it
13 up because if we stop and thing about it and look at
14 our country today, they said 20 years ago we'd never have
15 any pollution in the Puget Sound. Well all you have to do
16 today is to look and you can see pollution. The smelter
17 has been there for 70 years. Well, people say they have
18 done nothing to clean up. Well they have been working to
19 clean up that I know of for the last 30 years. I wouldn't
20 say the smelter is the cleanest place in the world but it
21 is not any dirtier than any other industry to work in.

22 So, being that I am retired and have no
23 connections whatsoever with the smelter or anyone else,
24 I still wanted to say the smelter is as good a place as
25 any other place in the country to work.

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1 I thank you.

2 HEARING OFFICER: Thank you, (b) (6) .

3 Any questions for (b) (6) ?

4 (No response.)

5 HEARING OFFICER: Thank you.

6 (b) (6) ?

7 (b) (6) : My name is (b) (6) .

8 I am a citizen of the north end of Tacoma. I am a member
9 of Tahomans for a Healthy Environment. Our position
10 today was submitted to you earlier in other testimony
11 in the hearing and I would like just to go on record
12 officially to request that you strengthen the arsenic
13 standards which are being proposed and congratulate the
14 people who chose to grow a garden in the North End, people
15 who are obviously long-lived and have been successful in
16 growing gardens there. I choose not to, that is my personal
17 choice because of what I believe to be the risks.

18 We request that tough standards be enforced.

19 We do not want to shut the smelter down. I know that
20 charge has been leveled against us. We would like to have
21 a secure economy in the Northwest and we'd like to have
22 also a clean environment.

23 I would like to take this opportunity to
24 congratulate the EPA for the new leadership we have in
25 Region 10 here. This Summer Ernesta Barnes--I would like

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1 to take the opportunity to tell you how nice it is
2 working with people who are accessible and who are
3 articulate. Pass that word on to the national level if
4 you can. Thank you.

5 HEARING OFFICER: Thank you, (b) (6).
6 Any questions for (b) (6) ?

7 (No response.)

8 HEARING OFFICER: Thank you, (b) (6).
9 (Applause.)

10 HEARING OFFICER: Are there any other
11 witnesses that would like to present testimony this
12 evening?

13 (No response.)

14 HEARING OFFICER: If not, I guess we will
15 bring the hearing to a close now. We will reconvene
16 tomorrow morning at 9:00 o'clock at the Stanley Elementary
17 School in Tacoma which is at 712 South 17th Street.

18 Thank you very much.

19 (Hearing adjourned at 9:20 p.m.)
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ASARCO ARSENIC TOXICITY AND THE PUBLIC HEALTH

AN ETHICAL PERSPECTIVE

KARUNA ALAN KISTLER, M.A.

Student of Public Health Ethics,
University of California at Berkeley

The arsenic currently escaping from the Asarco copper smelter in Tacoma is of grave concern not only to Asarco employees and Tacoma residents, but to all of us who assume the responsibility of promoting and protecting the public health. In the midst of an emotionally charged debate over the impact of Asarco's arsenic emissions on human health, the Environmental Protection Agency, guided primarily by the Clean Air and Toxic Substances Control Acts, must soon decide what steps Asarco must take to reduce airborne arsenic toxicity to an acceptable minimum that protects the public health. In making this decision, the E.P.A. must take into account not only the welter of personal testimonies of Asarco employees and officials and residents of Tacoma, but scientific data on arsenic toxicity and its impact on the public health as well. I would suggest, however, that this decision cannot be fully informed without taking into account the perspectives of public health ethics, which applies reasoned ethical arguments, based on accepted ethical principles, to complex public health dilemmas such as Asarco in the disciplined search for just and humane solutions that protect the public health.

The chronic, long-term effects of arsenic on human beings are only sparsely documented. Some studies show an increased incidence of lung and skin cancers among workers with high exposure; others were inconclusive. The greatest risk to human health appears to be lung cancer, and the E.P.A. has estimated that installing 4.5 million dollars worth

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of air pollution controls at Asarco, in the form of secondary hoods, would decrease the projected number of arsenic-related lung cancer deaths within twelve miles of the plant from four per year to one. Asarco officials have indicated a willingness to purchase and install these controls, and to study the possible investment of 150 million dollars more for a new furnace and related facilities, but say that if they are forced to spend this additional money, they will close the smelter, putting over 500 Asarco employees and 300 people in Tacoma out of work.

What are the crucial ethical considerations here?

Clearly, Asarco has the right to own and operate a copper smelter. Asarco employees have a right to a safe and healthy work place, and, at the same time, a possibly conflicting right to work at a job that contributes both to their quality of life and their own mental health. The people of Tacoma have a right to a healthy environment, including clean air that is safe from carcinogenic levels of arsenic. Finally, Americans across the country have this same right, a right that will be jeopardized if the E.P.A. decides to make an exception for Asarco and set a precedent for air quality standards that vary from region to region. Can these potentially conflicting rights be ethically weighed? If so, how?

To answer these questions, we must first discover accepted ethical principles that are at the heart of this dilemma. I would suggest that there are two. The first is the principle of limited autonomy; the second is the principle of non-maleficence, or prevention of harm. Prevention of harm in the Asarco case means, specifically, the protection of vulnerable human subjects from involuntary and uninformed exposure to arsenic.

Autonomy is classically defined as the right to do freely whatever one chooses, as long as it does not interfere with the rights of others

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to express themselves freely, or harm them in any way. Social and political control over individual behavior which limits human autonomy is ethically justified only if it is necessary to prevent harm to others. According to this principle of autonomy, controlling Asarco arsenic emissions, which limits the autonomy of Asarco officials and employees alike, is ethically justified only if current levels of arsenic toxicity can be shown to cause probable harm to the public health.

No one disputes that the Asarco plant is presently contaminating the environment with arsenic. I believe the evidence shows that the levels of contamination currently being measured are injurious to human health. Not only do several studies show an increased risk of lung cancer associated with airborne arsenic emissions, as previously mentioned, but high levels of arsenic have been found in the hair and urine of children as far away as Vashon Island. The National Academy of Science, in its report on Drinking Water and Health (Volume 4, p. 343), has concluded that our present levels of protection for arsenic, particularly in drinking water, "...may not provide an adequate margin of safety." Fetuses and neonates are particularly vulnerable to arsenic toxicity. Research has shown that arsenic in the form of sodium arsenate is dramatically teratogenic in mice and hamsters after a single dose of 15-20 mg. per kg.. By analogy with other teratogens, it is highly likely that human fetuses will be substantially more sensitive.

Are we willing to risk grave harm to our children and our unborn children in order to preserve the rights of officials and employees to choose how much toxicity they are willing to accept in order to keep the smelter open?

Clearly, preventing harm in this case is ethically more compelling than preserving an unlimited right to choose. This prevention of harm is, in fact, directly mandated in the introductory clauses of the Toxic Substances Control Act, which states plainly that the economic

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impact of E.P.A. decisions, while a necessary consideration, must in no way prevent the implementation of the strictest regulatory acts necessary to protect the public health.

Along with the prevention of harm to particularly vulnerable members of the public goes protection of human subjects from involuntary or uninformed exposure to toxic substances. Were the E.P.A. to allow Asarco an exemption from federal emission standards, it would be tacitly approving the concept that a specific human population may be exposed to uncertain risks. In effect, the E.P.A. would be sanctioning an epidemiological research project. In such circumstances, C.F.R. 40, based on the Geneva and Nuremberg codes, recognizes that human subjects have a right not to be exposed to risk to their health without voluntary, informed consent. What made experiments on human subjects at Nuremberg morally reprehensible, among other things, is that they were performed under conditions of unarguable coercion, which made voluntary consent impossible. Because employees at Asarco are legitimately afraid of losing their jobs, and people in Tacoma are legitimately afraid of the economic impact on their community of the threatened closing of the Asarco smelter, conditions of coercion exist, making truly voluntary consent impossible. Employees should be given public support and assistance if Asarco decides to close the Tacoma plant, but employee fears of losing their jobs must not dictate public policy, since they preclude truly voluntary consent. Children, neonates, and fetuses are commonly considered to be incapable of either voluntary or informed consent. Consequently, we have no right to expose them to health risk to which they are particularly vulnerable and over which they have no control.

The preceding discussion of reasoned ethical argument, proceeding from accepted ethical principles crucial to E.P.A.'s decision in the Asarco case, makes it clear that rights to prevention of harm to the public health and the protection of particularly vulnerable human subjects

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must take precedence over the more limited and less ethically compelling rights of Asarco and its employees and the citizens of Tacoma to choose how much arsenic toxicity they are willing to accept to protect jobs and financial security attendant on Asarco's copper smelter remaining open. From this it is clear that the E.P. A. must require Asarco to install the strictest possible pollution control devices necessary to reduce arsenic emissions to the lowest possible levels, since no threshold of toxicity for arsenic has yet been established. This requires not only the installation of secondary hoods, to control converter emissions, but also either installing a flue gas desulfurization system or using new smelting technology in order to further reduce fugitive emissions, which are currently considered to be strongly contributing to high arsenic levels found in the air near to the smelter. In addition, Asarco should be required to put into place a more refined system for monitoring and logging plant accidents leading to emissions as a means of preventing future arsenic emissions. It is also clear that direct measurement of actual levels of arsenic in the air--rather than theoretical dispersion models--are necessary to ensure that the most vulnerable among us, who may be harmed by very low levels of emission, will be adequately protected.

Finally, it is my fervent hope that not only will the E.P.A. find the preceeding ethical arguments compelling in the Asarco case, but that it will also make the vital contributions of the emerging discipline of public health ethics a standard part of its decision-making process as it carries out its mandate to preserve and protect the public health.

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2. Drinking Water and Health, Washington, D.C.: National Academy of Science, 1977.
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ADMINISTRATIVE REMOVAL

ASA219

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ADMINISTRATIVE REMOVAL

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9/19/83

Dear (b) ,

This is to answer your specific questions about arsenic trioxide, As_2O_3 :

- 1) ASARCO should be permitted to emit As_2O_3 at the rate they do because it really is not a pollutant, but is an essential nutrient. In the burning of coal high in As, tons of As_2O_3 are emitted each day in cities like Prague and many American cities.
- 2) No arsenical has been shown to cause cancer in animals--or to act as a co-carcinogen.
- 3) that includes As_2O_3 .
- 4) It's likely that As is needed by humans, but its essentiality thus far has been shown only for rats, chickens, pigs and goats.
- 5) Fish and Seafoods are good sources of As, but the As is bound in organic arsenical forms that are readily excreted. We don't yet know whether such forms of As will serve any body needs for As. Indeed, we know very little about what roles As may play in metabolism, if any. There are traces of As in most living things, if not all of them. I believe it will in time be found to catalyze the most important energy reaction, i.e. phosphorylation. It has been shown to catalyze phosphorylations in plants and animal tissues, but the true significance of this has yet to be shown.

The letter on the back of this briefly sketches something of what is known--in accord with the editor's request for no more than 250 words. As noted, the awesome problem comes that most of what people 'know' about 'arsenic' just isn't so. The enclosures may help clarify some points. The belief that 'arsenic' ought to cause cancer began at least a century ago and was easy to sell to the medical profession simply because of its reputation as a poison. The 'arsenic cancer in humans' grew by reiteration of the association; never by proof that it was so. Sir Ernest Kennaway, the Dean of cancer research in England, noted that the number of cancers that were said to come from Fowler's solution therapy (1% potassium arsenite) were so few compared with the extensive use of the medication that it constituted evidence against, rather than for, its carcinogenicity. Despite that, the idea prevailed, as has the idea that exposure to As_2O_3 may cause cancer in people. I have pointed out that various alternative causes for all the cancers assigned to As have appeared; also that the real evidence indicates that As appears to have anticancer value. If my way were paid to take part in the hearings Nov. 2 in Tacoma, I would be glad to take part. But what I can do quietly wringing on the subject may be more worthwhile and more acceptable. It's a complicated matter involving beliefs that cannot be proven, disproven or tested--much like religion. I hate to see you get too involved because I know it can become painful and troublesome. My hope is that Sec. Ruckelshaus will decide in the right way scientifically. It's pretty obvious though that the blind fear of ARSENIC may carry the day because it's coupled with CANCER. If that happens, ASARCO may fight the matter in the courts or may simply leave Tacoma. In that case, everyone loses. Ideally, decision will be postponed until research provides the needed answers.

We had a good day with friends yesterday at LG with good swims by (b) (6) and all--water and air just 70° F. It'll be warmer today and tomorrow; then colder later in the week. Hope your class work pleases you. Our best to (b) (6).

Love, (b) (6)
(b) (6)

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From (b) (6)
9/9/83

The News Tribune, Tacoma, Fri., Aug. 26, 1983 A-11

Arsenic a 'nutrient, not pollutant'

To the Editor: Your July 14 editorial invited opinions about weighing risks from arsenic. I have studied risks from arsenicals and exposure to AS since 1950 and published much on the matter. This is what the scientific evidence shows. Of the 100 natural elements in our universe, only about 32 are needed in animal nutrition. Arsenic is an essential nutrient and not a pollutant. No arsenical has found to cause cancer experimentally in animals and the "arsenic cancer in humans association" is an unproven and non-testable association. The real evidence suggests that arsenicals have anticancer value and this deserves study.

I first challenged the carcinogenicity of arsenic's sister element, selenium, beginning in 1960. The debate now concerns how much value selenium has, not only against cancer, but against heart disease. Yet selenium is far more toxic than arsenic and arsenicals

are the best antidotes to selenium toxicity. Recent research has indicated that arsenic-deficiency led to heart failure in animals. Evidence suggests that selenium-deficiencies in animals is a growing problem worldwide. Government studies have revealed that the levels of arsenic in American and Canadian foods have fallen sharply in recent years. Scientists agree that we still have a great deal to learn about the roles of the trace elements in biology; also that we still don't understand cancer.

It's been said that the greatest achievement of science is the humility and honesty with which it corrects its own mistakes and that's what makes science the greatest of the humanities. We all need to be right about the elements, and, you in Tacoma, need now to be right about arsenic.

D. V. FROST, PhD.,
(b) (6), Schenectady,
N.Y.

10/14/83
D.V. Frost

RATIONALE FOR DECREASED SE UPTAKE BY PLANTS

1. $SO_2 + SeO_2 \longrightarrow SC_4^{---} + Se^C$ Increases
2. Acid rain from fossil fuel burning ~~lowers~~ increases soil acidity and lowers soil pH.
3. Fallout from fossil fuels may form insoluble metal selenides, such as $HgSe$, $PbSe$ and As_2Se_3 .
4. Sulfated fertilizers - plants need S, but not Se.
5. N and P fertilization decreases plant uptake of Se.
6. Forms of Se excreted by animals are unavailable to plants.

DVF '83

Note - Shown as a slide at the Univ. of Guelph - Canadian Feed Industry Assn. Conference, April 26-27, 1983. It summarizes why I feel the Se-cycle is a loss one and why Se-responsive diseases emerge at increased rate worldwide in animals and people. Dr. Peter Peterson, Univ. of London's Monitoring and Assessment Research Centre (MARC), and Dr. G. Q. Yang, Inst. of Health-Chinese acad. Med. Sciences, agree. Dr. J. H. Watkinson, Rukura Soil and Plant Research, Hamilton, New Zealand, wrote, "Some organisms can oxidize elemental Se to selenite, but the balance tends to be in the reverse direction". I showed a slide of Dr. Kubota's evidence that rains across the U. S. increased in acidity from west to east with decreased Se-uptake by plants, but with very low Se in plants also in the Pacific northwest. Dr. G. A. Fleming, Agric. Inst., Wexford, Ireland, reproduced my early version of the Se-cycle loss and showed that nitrate fertilization also decreased Se-uptake by grass. A slide of Fleming's work was shown. None of these were included in the paper at Guelph and I see that I failed to call attention to the fact that excess S diminishes plant uptake of Se in the above slide. It's also known that Se-uptake in grass in urine patches, where grass grows best, was also diminished. Nothing I can find over more than 15 years study of the problem tends to indicate that the uptake of Se by plants is not diminishing. Dr. Hans Shacklette of the U.S. Geological Survey had sent me a report years ago indicating that soils east of the Mississippi river have more Se at plow depth than soils west of the river. He also sent reports of evidence that soils where Se-uptake by plants is high are alkaline and much evidence has shown the adverse effect of low pH on Se uptake by plants. We know least about the effects of metal ion accumulation, particularly formation of such metal selenides as those shown in point 3. It is possible that the diminished level of As in American and Canadian diets is due in part to the formation of unavailable arsenic selenides or sulfides. In any case, factors in both the Se and As cycles call for research. Soil amendment with Se compounds is now officially approved in New Zealand and selenite is being added to table salt at 10-15 ppm to counteract Keshan disease in people in China.

DVF, 4/30/83

If Se-deficiency is a growing problem due to a break in the Se cycle, as much evidence suggests, it has great significance for the health of animals and humans. Research is needed to confirm or deny this hypothesis. Acid rain contributes to diminished plant uptake of Se, thus to Se-deficiency, of importance in our area. DVF

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Douglas V. Frost, Ph.D.

CONSULTANT - NUTRITION BIOCHEMISTRY

(b) (6) SCHENECTADY, N. Y. 12308

Aug. 11, 1983

Central Docket Section (LE-131)
U. S. Environmental Protection Agency
401 M St., Washington, DC 20460

Docket No. CAQPS-79-8
Listing of arsenic as a hazardous pollutant

Comment:

Arsenic (As) has been shown to be an essential nutrient for four species by three laboratories. It is one of the most ubiquitous of elements, being found in all tissues of plants and animals. Although its precise role in biochemistry is unknown, it is thought to catalyze phosphorylations, the most important energy mechanism in living things. Its biochemical role is closely related to that of its sister element, selenium (Se). These two have perhaps the greatest electron transfer capabilities of all the elements, giving them the capabilities to catalyze oxidation-reduction (redox) mechanisms in metabolism. These capabilities also account for the recent evidence that Se and As function to counteract the toxicities of some heavy metals, such as Hg and Pb. Although both As and Se were long impugned as carcinogens, much evidence has shown that both have value against cancer; also against heart disease.

I first challenged the ideas that As and Se might cause cancer (Nutr. Rev. 18, 129, 1960). This led to the discovery that cancer death rate appears to be inverse to Se bioavailability (Canad. Med. Assn. J. 100, 682, 1969), a possibility now being considered seriously by our National Cancer Inst.. Throughout this period, I continued to publish on the evidence that As is not only not a carcinogen, but appears to have value against cancer (Fed. Proc. 26, 194-208, 1967; World Rev. Pest Control 9, 6-27, 1970; The Two Faces of Arsenic-Can Arsenophobia BeCured? In: Arsen. 3. Spurenelement Symposium 1980, Eds. M. Anke, H.J. Schneider, C. Bruckner, Karl Marx Univ. Leipzig and Friedrich Schiller Univ., JENA, 1980, pp. 17-23). In July, 1983, I presented an invited paper at the same universities in East Germany, titled The Unforeseen Need for Arsenic and Selenium for Optimum Health. At that meeting Prof. Anke gave further evidence for the essentiality of As and noted that animals with severe As-deficiency develop heart and muscle lesions leading to death.

The remarkable situation exists that the level of As in American and Canadian foods has fallen sharply in recent years (Environ. Health Perspect. 19, 83, 1977; Pesticide Sci. 6, 75, 1975). I have raised the question, What Do Losses in Se and As Bioavailability Signify for Health? (Science Total Environ. 28, 455, 1983). We do not know how much As is needed by humans, but do know that certain arsenicals improve the health, appearance and well-being of some domestic animals. Evidence is that people getting arsenical water in Fallon, NV, towns in Utah and in Montana have somewhat better health than people in nearby towns getting non-arsenical water.

The entire 'arsenic cancer in humans association' is wrong and EPA should drop it.

Respectfully

D. V. Frost
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8/11/83

Dear (b) and (b),

The reverse notes a bit of my effort to alter the EPA's attitude toward As and what it's doing in Tacoma. (b) (6) in Tacoma has sent me many news items there over the last few months and the item I sent to the paper may get published, though it hasn't yet.

You may recall that I served on an EPA committee when Ruckelshaus was first at the EPA. I chaired the EPA PAX Co. Arsenic Advisory Committee. We concluded the PAX product was safe and I so wrote Ruckelshaus. But just at that time reports came from Dow and Allied Chemical blaming exposure to As for cancer in workmen. They were retrospective studies and really meant little, but were accepted as factual at the time by most every one. A culprit was needed and found. It was as simple as that. It built on the Lee-Fraumenii concept, published from the National Cancer Inst. in the late '60s that smelter workers had a higher rate of cancer than non-smelter workers and that this applied mainly to As-smelter workers. They had exposure to SO₂ in the picture, but As got all the heat. I've pointed out in various publications that there are many other more likely causes for the cancers assigned to As, mainly methyl sulfates, known to cause cancer in animals; also various dusts containing known metal carcinogens other than As.

I doubt I'll be asked to testify in Tacoma Aug. 30 and am not anxious to do so. Those Hearings won't decide the issue and there will be more later. Indeed, as you may know, there is a whole series of meetings underway at Vashon Id. and in Tacoma prior to the Aug. 30 Hearings. Sentiment and opinion will run high and it will take a cooling off period, I believe, before the right decision is reached. In the meantime, I expect (b) (6) will keep me informed. The news clipping you sent was apropos.

It came as a complete surprise to be awarded the Friedrich-Schiller Univ. medal for my work on As and Se at the meeting in JENA. Besides giving my paper there, I was asked to chair that session on As and Se. The City Council of Fallon helped pay my way to give that paper and they continue to hold out against the EPA's demands to remove half the As from their water supply. The Navy Air Station, beside Fallon, has As-water and is doing an experiment at large tax-payer cost to remove the As using alumina. That puts Al in the water while removing some As. The Fallonites would much prefer the As as they have had it for at least 45 years and know it does not hurt them.

(b) and I will have a few people at LG Saturday and look forward to (b) (6) coming a bit later. (b) swims here and at LG and is slowly improving. Share these items with (b) (6). I sent her different ones. Hope all's well there and with your difficult assignment, (b) (6).

Love,

(b) (6)

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ASA219

WHAT DO LOSSES IN SELENIUM AND ARSENIC BIOAVAILABILITY SIGNIFY FOR HEALTH?

DOUGLAS V. PROST

(b) (6), Schenectady, New York, USA 12308

ABSTRACT

Levels of As and Se in human foods and animal feeds respectively have decreased in recent years as a result of official limits and other factors. The reduction of SeO_2 by SO_2 to Se^0 results in less bioavailability in the food cycle. Acid rain further reduces the pH of Se-depleted soils and soluble forms of Se are bound by metal ions in fallout from burning of fossil fuels. However, there is evidence that Se and As act as essential nutrients with anticancer value. The need for As in nutrition was shown by three laboratories in four mammalian species. Selenium inadequacies among people, as well as animals, are being recognized worldwide in the form of Se-responsive diseases. Reported data indicate that we have yet to learn the optimal intake levels for Se or As and how their decreased bioavailabilities affect human health.

INTRODUCTION

Selenium (Se) deficiencies are being seen with increasing frequency. Se-responsive animal diseases have been described for over two decades [1-6]. Studies begun in 1969 [7] to test the possibility that Se inadequacy may underlie susceptibility to human cancer led to evidence, only partly cited here, that Se has value for the prevention and regression of cancers [8-10]. Yet epidemiological evidence has inherent flaws [11-13] and calls for more research. The evidence that Se inadequacy leads toward heart disease seems secure in animals [14-16] and humans [17-19]. Discovery in China that Keshan disease cardiomyopathy in children responded to Se supplementation helped cognition in the U.S. that Se is an essential nutrient for humans [20,21]. At least a million people are being treated with sodium selenite in China.

Evidence indicates that arsenic (As) is also an essential element [22-24]. But levels of As in American and Canadian diets have fallen sharply [25,26]. Whereas As intakes from ordinary diets were about 70 $\mu\text{g}/\text{day}$ in the 1960s, they fell to 20 to 30 $\mu\text{g}/\text{day}$ in the '70s. Arsenophobia led to the banning of most uses of inorganic arsenicals in agriculture and in medicine.

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Efforts by the Environmental Protection Agency to enforce the removal of levels of As above 0.05 mg/L in natural waters was supported by the NAS-NRC Safe Drinking Water Committee [27]. These actions reflect the strength of the dogma concerning an arsenic:cancer-in-humans association; a dogma that defies proof. No other element has been so consistently and unequivocally shown incapable of causing experimental cancer in animals as As and its compounds [28-30]. There are many more likely causes for the cancers in humans for which As is blamed.

One of the most likely alternative causes is dimethyl sulfate, a known carcinogen which is an airborne particulate from coal burning and smelter operations [31]. Another possibility, according to Chinese scientists, may be ergot alkaloids, which is fluorescent material in Taiwan well water, long associated with cancer that was thought to be caused by As in the water [32]. The troublesome water that had been piped through bamboo had caused Blackfoot disease, a gangrene of the lower legs, as well as a high incidence of cancer.

The purpose of this paper is to create an awareness of the health problems that appear to have resulted from unwarranted judgments of the toxicity of Se and As. I document the diminishing concentrations of those elements and postulate what those losses may eventually mean to human health.

SELENIUM

The cycles of As and Se favor development of their deficiencies. This is seen particularly in the characteristics of the Se cycle, Fig. 1., first published in 1967 [33] and revised later [16,18,34,35].

The Se-dependent glutathione peroxidase, Se-GSHPx, acts with vitamin E to minimize free radical damage from aberrant oxidations [36,37]. I found evidence which suggests that As catalyzes the biosynthesis of glutathione [30]. If so, this would bring the metabolic roles of Se and As close together and would help explain why both elements have anticancer value along with glutathione itself [38,39]. It may help explain why Se and As counteract each other's toxicities in that both appear to be intimately involved with glutathione metabolism. This may involve the role of the two forms of GSHPx, one Se-dependent and the other, known as glutathione transferase, Se-independent.

Se forms selenides with most metals. Se and vitamin E act as antidotes to various heavy metal toxicities [40]. Traces of As enhance the value of Se against Hg and methyl mercury toxicities [41]. In their natural cycles, Se and As accumulate in aquatic species at levels above those in land animals. Such accumulations are not toxic to aquatic animals nor to humans. They may represent ways by which Se and As protect aquatic animals against metal toxicities. Se appears to be essential to animals but not plants which represents a distinction

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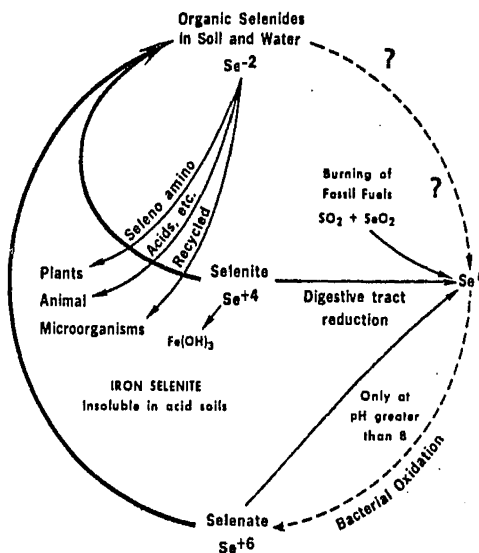


Fig. 1. The possibilities of selenium cycles that suggest losses of bioavailability.

between the animal and vegetable kingdoms attained via evolution. I found evidence that As catalyzes phosphorylations in both plants and animals [42,43].

Decreased bioavailability

Loss in the bioavailability of Se in the Se cycle that appeared significant in terms of human and animal nutrition, which I reported in 1966-67 [33], was not readily accepted [44]. In time, however, the statement was made, "Any soil-plant-animal chain of food production that is operating on acid or neutral soil will ultimately become depleted of 'biologically effective' forms of Se" [45]. When it was found that the major excretory form of Se by animals, trimethylselenonium ion, is unavailable to wheat [46], there remained no doubt that there is now a steady loss of available Se from the food cycle. Although reviewed in part [16,18,33,34], the magnitude of the question and my inability to deal satisfactorily with it is recognized. Butler and Peterson [47] first questioned the reality of a Se cycle for sheep on grasslands. They showed that the form of Se in sheep feces

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diseases [1-4]. Locally raised crops have supported families for generations in China and it seems likely that the coal burning practices and related factors have led to the truly remarkable situation that exists in land areas there now. It offers an opportunity to study what environmental factors influence the bioavailability of Se. Coals very high in Se content, with one sample having nearly 5% Se, were reported [53]. Whether the burning of such coals in simple stoves over generations could account for the buildup of plant-available Se in some areas, but plant-unavailable Se in contiguous areas, remains to be learned. The selenosis areas would have to be alkaline soils and perhaps contain bacteria able to convert Se^0 to selenate Se^+ , readily taken up by plants. Such bacteria have been noted [54]. The areas of Keshan disease would be expected to have acid soils in which the Se would be unavailable to plants. It seems likely that time-honored farm practices must have played a part, yet to be discovered, in what is happening in China, revealing both excesses and deficiencies of Se.

ARSENIC

✓ No other element is so misunderstood and unfairly maligned as As. Even though Fowler's solution was said to be the best agent in the U.S. Pharmacopeia and arsenicals were the first magic bullets in medicine [42], such have been lost via the strength of the 'arsenic:cancer-in-humans association'. The truth of this cannot be tested in humans and the effort to disprove the association has been directed towards finding alternative causes of the cancers for which As is blamed. In the long learning process about As, which I have undergone for over 30 years, I have reported finding definite alternative causes and also clear evidence that arsenicals have anticancer value [30,42,43]. Others have supported this [26,29]. Although evidence for the nutritional need for As in animals [22,24] seems clear, no As-dependent enzymes are yet known, leaving only the evidence that As stimulates phosphorylations [30,42,43]. As noted above, much research has indicated anticancer value for arsenicals and a basis for such value has been sought. One possibility came with the report that glutathione regressed liver cancers induced by aflatoxin [38]. In a footnote to my paper at the Arsenic-Nickel Symposium of 1980 [30], I had noted preliminary evidence that As plays a role in the biosynthesis of glutathione. If this is true, the anticancer value of arsenicals follows directly. The validity of the Novi report [38] is supported by contemporaneous evidence [39] indicating that the oxidation-reduction cycle of glutathione acts as a major defense mechanism of tumor cells against oxidative injury. In the latter experiments, it was found that tumor cells in Se-deficient mice proved far more sensitive to damage from hydrogen peroxide than tumor cells from control mice, confirming the value of the Se-GSHPx in protection of cell membranes [16].

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was Se^0 and was not taken up by plants. With the finding by Olson et al. [46] that urinary Se is also unavailable for uptake by plants, we concluded [18] that "...inadequacies of Se will occur at increased rate unless precautionary steps are taken to insure the adequacy of Se in animal feeds, in human foods, or in individuals directly".

The affinity of animal tissues for Se, representing more than 100-fold concentration from the land and 1000-fold from the sea, may be matched or counteracted by even stronger affinities between certain metals and Se. Competition between S and Se for uptake by plants favors the uptake of S due to the use of sulfated fertilizers. The 10,000-fold S/Se ratio in most coals leads to a large fall-out of S as sulfate ions from coal burning. In any case, the dominant reaction: $2\text{SO}_2 + \text{SeO}_2 = 2\text{SO}_3 + \text{Se}^0$, in fossil fuel burning insures the unavailability of Se from this source on neutral or acid soils. More anthropogenic S comes from fossil fuels than that from volcanoes [48].

The mapping of plant uptake of Se revealed little or no plant uptake of Se in northeastern U.S. or in Denmark, areas both influenced by acid rains [49]. Levels of Se in corn raised on the Morrill plot at the University of Illinois decreased while the yield of corn increased [50]. Levels of Se in dried whey reflected ambient availability of Se in crops [51]. Since animals derive Se from foodstuffs, the Se deficiency is readily demonstrated from plants. I found that zoo animals suffered Se deficiencies [52]. Levels of Se in swine muscle were found to reflect the levels of Se in swine rations in the U.S., with the lowest levels the farthest east or west of the Mississippi river. [18].

Toxicity

Areas of Se toxicity in farm animals and people were reported in China [53]. These are contiguous to the areas of Keshan disease and the reasons for these wide differences in the distribution and bioavailability of Se remain unknown. Arsenite feeding to Se-poisoned farm animals was shown to counteract the toxicity [53]. This was interpreted as proof that the toxicity seen is indeed due to too much Se. However, general arsenophobia has thus far inhibited the Chinese scientists from using arsenicals to counter the selenosis seen in people. When in China in June, 1981, on behalf of the Ministry of Health of China and the WHO, I urged the use of arsenicals in people, pointing to the evidence that As is an essential nutrient. I have reiterated that argument for the safe use of arsenicals to Dr. G.Q. Yang by letter and hope it will be done. It is as fine an opportunity to demonstrate the usefulness and safety of As for humans as applied in China's major breakthrough in the large scale use of sodium selenite against the cardiomyopathy of Keshan disease. Keshan disease was discovered as a health problem in people about 1935. This correlates with early reports of similar health problems in animals in New Zealand and Finland. By the late '50s, these had been shown to be Se-responsive animal

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As Nathan et al. [39] elegantly showed, the GSH redox system defends tumor cells against oxidative damage. Non-cancer cells rely on similar biochemical mechanisms to protect cell wall integrity.

Merely citing the wealth of evidence that arsenicals reduced cancer induction or incidence of spontaneous cancer, and induced cancer regression [30,42,43], has left many investigators as yet unconvinced. A biochemical basis for such effects must be found and accepted. A role for As in GSH biosynthesis has been suggested, but not proven [30]. The fact that S-n-butyl homocysteine sulfoximine (butathione sulfoximine) inhibits GSH biosynthesis specifically supports the concept [55]. It would be expected to bond with and inactivate As⁺⁺⁺ compounds. Erythrocytes contain relatively high levels of As and of GSH, but why this is so is unknown. The integrity of red blood cells is diminished in As deficiency. [22].

Probable As cycles [42,56] and an As ecodiagram [43] shown in Fig. 2, fail to depict the probable interactions between As and other elements which may alter the cycle. As-cycling [39,56-58] requires microbial methylation to volatile arsines.

Toxicity

The erroneous belief has developed that methyl arsines are highly toxic, but there is no pharmacological proof for this that I could find. Methylation of As by animals [56] and humans [59] appears to be a detoxification mechanism common to most forms of life. In aquatic species, this leads to arsenobetaine [60] or to cacodylic acid [61,62].

The unexpected discovery was reported [63] that excreta from swine fed organic arsenical feed additives, like arsanilic acid, have improved characteristics for use as fertilizer. This involves bacteriological alterations not yet defined but are reminiscent of the fact that organic arsenicals were long used against protozoal infections in humans and are still used against infectious enteritis, coccidiosis, and blackhead in animals. Plant leaves have higher As levels than most other parts of plants. The first NBS Standard Reference Material, prepared from the leaves of fruit trees, has 10 mg/kg As on a dry basis. This and other disconnected bits of information about As led me to analyzing past practices and research more carefully [64-66]. Other work addressed the role of As in Se metabolism. The possibility appeared that long over-dosage with arsenite (Fowler's Solution) may be found to have interfered with Se metabolism, thereby leading to hyperkeratosis and other skin abnormalities [67]. Such arsenite overdosage may have increased susceptibility to skin cancer, though this was never proven.

CONCLUSIONS AND RECOMMENDATIONS

Even though selenite Se has been used veterinarily for 20 years, clinical studies with selenite in human medicine remain in limbo in the U.S. Evidence that heart disease, resembling Keshan cardiomyopathy, occurs here may elicit the development

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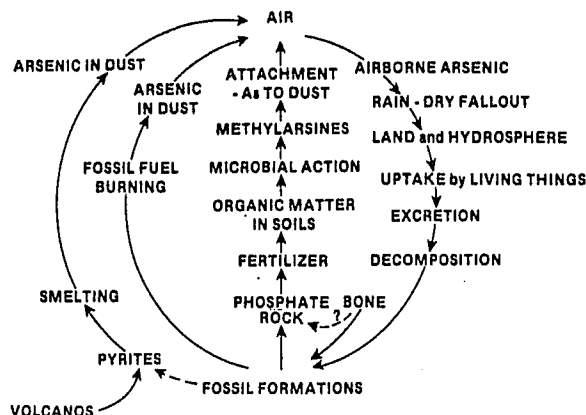


Fig. 2. Sources and movements of arsenic in the environment

of suitable products for clinical testing [68-70]. Opportunities abound to test selenite with vitamin E against metal toxicities [40,71,72], heart disease [16-21,73], cancer [7-10], arthritic conditions, such as bursitis and knee problems [74], and in problems involving vision [5,75]. Evidence indicates that Se inadequacy poses a far more serious threat to health than any likelihood of getting too much Se. The same applies for As, but much research is needed to bring about the reversal in attitudes toward As that are now underway toward Se.

An NAS-NRC review of As [56] noted. "Our greatest area of ignorance about arsenicals in the environment has to do with the cycling of arsenic compounds. ...Arsenic is continuously cycling in the environment, because of oxidation, reduction and methylation reactions. Man's activities can alter the distribution of arsenic in finite geographical areas or in selected components of the environment, but man has little control over the natural processes." More Se in soils at plow depth east of the Mississippi than west of it were reported [76]. Soils of the eastern and southern parts of the Atlantic Coastal Plain were found to have low levels of both Se and As. These areas, the so-called Stroke Belt or Enigma of the Southeast, have high cardiovascular disease (CVD) mortality and high rate of hypertension. Although both abnormalities have been related to Se inadequacy and possible high cadmium intakes [77], the logical question may be asked whether As inadequacy may be an additional factor. The Se inadequacy of plant foods raised in the Stroke Belt is expected to increase with current agricultural practices but could be corrected to some extent by judicious foliar application of selenite or its

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application directly to soils. The promising use of selenicals against plant pests [33], long forbidden by law [35], would help to some extent. Thus, I conclude that both natural and anthropogenically induced processes appear now to be contributing to the health ills of the Stroke Belt. Whether this is true for As, as well as for Se, remains to be learned.

Reappraisal is needed as to regulatory limits for As and Se in water. If both are viewed correctly as essential nutrients, such limits have a different perspective. While serving on the 1971 EPA Drinking Water Standards Committee, Dr. H. E. Stokinger and I offered reasons why the limits for As in water should be raised from 0.05 to 0.1 mg⁻¹ and those for Se from 0.01 to 0.05 mg⁻¹. After we failed on both counts, Stokinger wrote a strong plea for reality in such matters of regulatory excess and bias [76]. Metal interactions [79] are extremely complex and further research is needed because recent studies [80] found that the cancer rate is lower in some towns with As-waters than in adjacent towns with non-arsenical water. Reporting for the Human Nutrition Division of U.S. Department of Agriculture, Dr. Walter Mertz recognized the essentiality of As and the evidence that the levels of As in American and Canadian diets have fallen to what may be considered marginal or deficient levels. He wrote "...the fact that severe disease, sudden heart death, appearing in the third generation of arsenic-deficient goats, should serve as strong motivation for intensive future research."

Many factors were found to influence the volatilization of ²⁵Se from soil to which selenite was added, with microbial activity the most important [81]. This source of Se in the Se cycle may be of little consequence due to its questionable availability for uptake by plants. The increased availability of Se, to people in Finland, from milk was ascribed to the increased use of Se in animal feeds [82]. Yet Finland has a very high rate of degenerative heart disease due apparently to Se deficiency [18,19,73]. The range of safe to adequate Se intakes for humans has been suggested to about 50 and 300 µg day⁻¹ [83], with the intakes in Finland, Sweden, China and New Zealand minimal to deficient, generally below 50 µg day⁻¹. Very low Se intakes of about 12 µg Se day⁻¹ by children in the Keshan disease areas of China and an average of about 30 µg Se day⁻¹ for people in Finland, Sweden and the North island of New Zealand offer opportunities to study the vagaries of the Se cycle. With the adequacy of Se intake clearly tied to susceptibility to cardiovascular disease, such studies should go forward. The matter of Se deficiencies in animals and in humans in Finland, reviewed by Westermarck [84] and further developed at the Mineral Elements '80 symposium at Helsinki [73], provide an adequate basis for studies in Finland. Studies there revealed that reindeer meat contains about 7 times as much Se as beef. This is ascribed to the fact that reindeer subsist on lichen which are weak Se-accumulator plants [85]. The question comes whether such profound ecological disturbances as acid rains [86] may in time reduce the availability of Se to such Se-dependent species. Confirmation [87] that selenite

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with vitamin A suppressed experimental cancer far better than either alone should lead to clinical evaluation against human cancer.

Research progress as to the significance of the As cycle is virtually non-existent. This is because of the belief that As is not only toxic but carcinogenic and the fact that a need for As in nutrition was developed only recently. The discoveries that the As intakes in representative U.S. and Canadian diets have fallen to critical nutrient levels should alert governments to the potential problem of As deficiencies.

Confirmation of the finding that the addition of As enhanced the value of Se to counteract methylmercury toxicity [88] is a step toward understanding the value of adequate As levels. Biomagnification of methylmercury in the food chain, particularly in game fish, is well established. The fact that Se has been reported to have value against this biomagnification and the toxicity of MeHg itself, and the further findings that As enhances Se's value against MeHg toxicity reflect something of the importance of their roles in biology.

Clearly, the recycling of redox elements like Se and As involves many unknowns calling for open-mindedness and research. We need to learn how and why they counteract not only each other's toxicities, but the toxicities of some other heavy metals.

Research is needed to place the safe uses of selenicals and arsenicals in proper perspective in agriculture and in human medicine; also to insure that their availability via the food chain is not seriously impaired. The ecologic impacts of man's activities on the bioavailabilities of Se and As can be firmly established only by stepwise research.

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ABSTRACT

MONITORING AND REDUCING TOXIC INTAKE OF CHILDREN NEAR THE TACOMA SMELTER AND IN SOUTH PARK, SEATTLE.

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John Roberts is the president of Engineering Plus, specializing in air pollution and boiler efficiency at 1425 E. Prospect #3, Seattle, WA 98112. He formerly worked for the Puget Sound Air Pollution Control Agency. Deborah Barto, M.D., is Chief of Medicine and Oncology at the Evergreen General Hospital in Kirkland, Washington. She is medical advisor and board member of the Community Hospice. She has an internal medicine practice with a specialty in oncology.

The potential intake and health effects for small children living in South Park (S.P.) and near the Tacoma Smelter (SML) were estimated. Data on emissions as well as concentrations of arsenic (As), cadmium (Cd), lead (Pb), and benzo-a-pyrene (BaP) in air, road dust, house dust, soil, leafy vegetables, urine, hair and blood were reviewed.

The 4 to 30% of children with dust or soil pica eat one to ten grams of dust and may exceed allowable daily intake for Cd, Pb and BaP near the smelter and in South Park.

Ingestion of dust was calculated to be the major route of entry for toxics for small children. Diet is a large source for Cd and BaP. Good personal hygiene and housekeeping, control of road dust, dietary strategies, biological monitoring and relocation may be necessary to reduce toxics in the body by 50%. These methods have been used by the SML and the lead industry to protect workers. Such action is needed to multiply the value of industrial emission controls and lower the cost of achieving health standards. Family action encouraged by public education guided by doctors and evaluated by biological monitoring is essential to reduce ingestion of toxicants. These methods may be an affordable way to mitigate the impact of present emissions.

Annual Meeting of Pacific Northwest International Section of the Air Pollution Control Association, Seattle, Nov. 16-18, 1983. Presentation time, 430 PM, Thur., Nov. 17, Seattle Sheraton.

MONITORING AND REDUCING TOXIC INTAKE OF CHILDREN NEAR THE TACOMA SMELTER AND IN SOUTH PARK, SEATTLE.

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OVERVIEW

The four to 30% of children who compulsively eat non-food items (have pica) near the Tacoma Smelter and in South Park, Seattle, may exceed acceptable levels of intake for cadmium, lead and benzo-a-pyrene. Children near the Smelter have arsenic in their urine which is approximately three times normal. Recommendations are made for monitoring and reducing toxic intake of children.

INTRODUCTION:

Reducing toxic emissions is essential to reduce human intake and health risks. However, social, technical, economic, and political forces cause continued emissions that are associated with disease. Source growth and the increasing incremental cost of higher levels of emission control make other methods of reducing low-level toxic intake cost effective. Families who take responsibility for and monitor their children's toxic intake will be able to reduce health hazards from current emissions and residuals from past emissions found in dust and soil. Much data suggest that a child's toxic intake is related to family decisions such as personal hygiene, housekeeping, house location, smoking and diet, as well as the magnitude of emissions.

Industry has used good hygiene, housekeeping and biological monitoring to reduce toxic intake on-the-job in a cost effective manner. Is it possible to reduce health risks for children at an affordable cost by family action in a way similar to that used in the workplace? The goals of this research relate to this question and are to:

- (1) Review available data on toxicity and emissions as well as environmental and body concentrations of arsenic (As), cadmium (Cd), lead (Pb), and benzo-a-pyrene (BaP) around the ASARCO Smelter and in South Park (S.P.);
- (2) Estimate potential intake and health effects for children with soil or dust pica. (Pica is the compulsive eating of non-food items.)
- (3) Make recommendations for measuring and reducing toxic intake of children.

TOXIC EMISSIONS, ENVIRONMENTAL CONCENTRATION AND BODY BURDENS

S. P. is located in Seattle's Duwamish Valley, west of Boeing Field close to industrial sources surrounded by high traffic volumes in a valley where topography and meteorology combine to concentrate air pollution. S. P. has many unpaved parking lots, storage yards and road shoulders.

The estimated emission from the Tacoma Smelter for 1982 from the tall stack and low level sources in tons per year were As = 102, Cd = 1.0, Pb = 25.9, and mercury = 0.4 (1,2,3).

The primary sources of toxic emissions are auto exhaust, metal processing, combustion of oil, wood, waste and coal, cement plants, and insecticides (4,5,6). Leaded gasoline emissions are the predominant source of lead in S.P. Wood stoves and fireplaces are a source of BaP (5). Cadmium is found in rubber particles which come from tire wear and carpet backing, as well as cigarette smoke.

The air, house dust, road dust, soil, leafy vegetation and body concentrations within one mile of ASARCO and in South Park as well as norms for hair, urine, soil, air and vegetables, are listed in Table I. A child with soil pica may eat one to ten grams of dust or soil a day (7,8). Four to 30% of the small children have pica(8). The potential daily intake of such a two-year-old child in micrograms per day (ug/D) is calculated in Table II by adding the amount received from air, soil or road dust, one serving of vegetables from a home garden near ASARCO, and the balance of the diet. The concentrations in Table I are used in the calculations in Table II.

The assumptions used in making Table II are:

1. Eight cubic meters (m³) of air are inhaled daily by a two-year-old child who weighs 9.1 kilograms (20 pounds). Weight was used to determine acceptable Cd intake.
2. Two grams of soil from the top centimeter are ingested each day near ASARCO. Two grams of road dust are ingested each day in S.P. Road dust is more available in S.P. than soil.
3. One serving (5.5 grams dry weight) of locally grown leafy vegetables are included in the diet of a child near ASARCO.
4. Intake from the balance of the diet is one-third that of an adult.

The acceptable daily intake for Cd is 10, Pb is 300, and BaP is 0.048 ug (5,17,20). EPA assumes that risks will be present at any level of exposure for carcinogens such as As and BaP(24). The acceptable intake for BaP was estimated to produce a risk of 1/1,000,000 for cancer (5).

The inhalable road dust density in S.P. is 1152 tons/mile² per year (below ten microns in diameter) compared with less than 150 tons/mi² for a clean residential area (25). BaP was found in S.P. dust but not in North Park in Seattle (25). Dust aids the entry of small As, Cd, Pb and BaP particles into the mouth and lungs because they become bound to the surfaces of larger dust particles (3,25,26). Rain or suspension in water does not separate most toxic particles from the dust (26).

Table I indicates elevated levels of toxicants in the environment and body. Table II suggests children with pica may exceed acceptable daily intake for Cd, Pb and BaP by a factor of 5.9, 7.9 and 6.1 near ASARCO and 2.9, 4 and 11 respectively for S.P. These intake standards have been set by the World Health Organization and recommended by EPA officials to protect health after careful review of available knowledge. Children who eat more than three grams of soil each day near ASARCO for 2 or 3 weeks may exceed arsenic intake associated with acute disease (27). The bioavailability of As, Pb and Cd near ASARCO and in S.P. determines body adsorption rates and needs to be checked by biological monitoring.

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TABLE I
TOXIC CONCENTRATIONS NEAR THE TACOMA SHELTER AND IN SOUTH PARK, SEATTLE

TYPE OF CONCENTRATION	Mo (REFERENCE) Samples	ARSENIC		CADMIUM		LEAD		SbP		NOTES
		Ave	Max	Ave	Max	Ave	Max	Ave	Max	
ONE MILE FROM TACOMA SHELTER										
AIR ug/m ³	(2)(13)(6) 7-1000	0.9	24.7	0.01		0.39				1982
Ave. Urban Air	(5)(13)	0.02		0.002		0.08		<0.002		
PPM Top cm	(10) 7	841	2700	8	17	1124	3150			1983
SOIL Top 6 inches	(11) 17	93	332	4	15					1983
PPM Top 6 inches	(12) 27-31	210	470	6.8	15	796	1800			1977
SOIL Normal Soil	(13)	1-10		0.15		10-15				
PPM HOUSE DUST	(13) 8-13	470	1300	15.9	35	1328	4723			1974
PPM Dry wt. LEAFY VEGETABLES	(12) 27-77	4.8	17	5.8	28	14.1	50			1977
NORMAL LEAFY VEG.	(12) 3	0.7		0.2-1.2		10.0				
URINE 0-5 yr	(14) 5	59	118	15 ug/L norm for						June 83
4-12 yr	10	41		As in urine						
13-20 yr	7	14								
PPM Hair										
Ruston 3rd & 4th Gr	(15) 7	58								1972
Age 11-12 1st 6 cm.	(16) 20	4.7	21	2.3	16.4	5	20.6			1975
POPULATION NORMS	(50) >423	0.2		0.1		1.3-3.2				1982
SOUTH PARK, SEATTLE										
AIR ug/m ³	(21)(22)	<.11(e)		<.01(e)		0.5(e)		<.002(e)		e-estimated
PPM HOUSE DUST	(21) 9	6.4	22	25.2	62	1029	3200	0.14	0.30	1981
PPM ROAD DUST	(21) 11	14.1	30	9	25	580	1500	0.11	0.35	1981
BLOOD ug/100 ml										
Ave. Age 62	(22) 27	20.1				42.1	53.7			1976

TABLE II
TACOMA SHELTER & SOUTH PARK AREA
POTENTIAL INTAKE OF CHILD WITH PECA ug/DAY

MEDIA		ARSENIC		CADMIUM		LEAD		SbP	
AREA	(REFERENCE)	ASARCO S.P.		ASARCO S.P.		ASARCO S.P.		ASARCO S.P.	
AIR		7.2	.8	0.1	.08	3.1	4.0	---	.016
SOIL ASARCO 2g Top cm.		1722		16.0		2248		---	.22
DUST S.P. 2g		28.2		18.0		1160		---	
LOCAL DRY WT. VEG. 5.5g		26.4	---	32.0	---	77.6	---	---	---
BALANCE OF DIET	(5)(17) (18)(23)	7	7	11	11	30	30	.293	.293
POTENTIAL AND ACCEPTABLE INTAKE ug/DAY									
TOTAL DAILY INTAKE		1763	36	59	29	2359	1194	.293	.329
ACCEPTABLE INTAKE	(5)(17)(20)			10	10	300	300	.048	.048
TOXIC RATIO DAILY/ACCEPTABLE				5.9	2.9	7.9	4	6.1	11

S.P. = South Park

> = More Than

< = Less Than

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ROUTE OF ENTRY

Table II suggests that the ingestion of soil or dust is the major source of toxics for children with pica. The balance of the diet exceeds allowable intake levels for BaP by a factor of six. The following observations support the importance of the oral route entry for preschool children. The quantity of As in children's (1983 sample) daily urine (14 to 116 ug) excretion on the average exceeds that which could come from breathing 8 m³ of average outside air (8 m³/day x .9 ug/m³ = 7.2 ug/day) by a factor of two to sixteen. Younger children who eat the most dust have the higher amounts of arsenic in urine. Air As concentration indoors is predicted to average less than outdoors such that being indoors would reduce As intake from air (19). Urinary As of children living in houses that are close together may differ by a factor of three. Lead studies in Kellogg, Idaho, and El Paso, Texas, have shown a strong correlation of house Pb concentrations, house cleanliness and pica, with blood lead levels (28,29). Studies of children near a Belgium lead smelter show intake from lead on hands contributed to blood leads at least 2 to 4 times more than air lead. Control of the oral route of entry of toxics has been one of the most effective ways to protect workers from As, Pb and Cd (31,32,33). Japanese lead workers are able to maintain lower blood leads than U.S. workers with less use of face masks because of strict hygiene and the cleaning of surfaces that collect dust (32).

CASE STUDY - ARSENIC CONCENTRATIONS IN AIR AND URINE NEAR THE TACOMA SMELTER

Figure 1 shows the data for urinary arsenic concentrations in micrograms per liter (ug/L) for Ruston (near ASARCO) children and Tacoma Smelter workers, as well as annual average air As concentrations in ug/m³ (33,34,35). The number of children sampled in the six points on the graph from 1972 to 1983 were 19, 107, 106, 102, 68 and 22 respectively. There is a weak downward trend in this data for arsenic in children's urine and no trend for As in the ambient air. The average of preschool children sampled in 1972 (270 ug/L) and 1976 (120 ug/L) exceed the average of the smelter workers although the significance of the difference is reduced by the small number of preschool measurements (nine and 42 samples). Curtailment of ASARCO operations and seasonal variations in urine make comparison of spot urinary arsenic more complex. Ruston children's urinary arsenics are three times the background urine of 15 ug/L in the June 1983 samples.

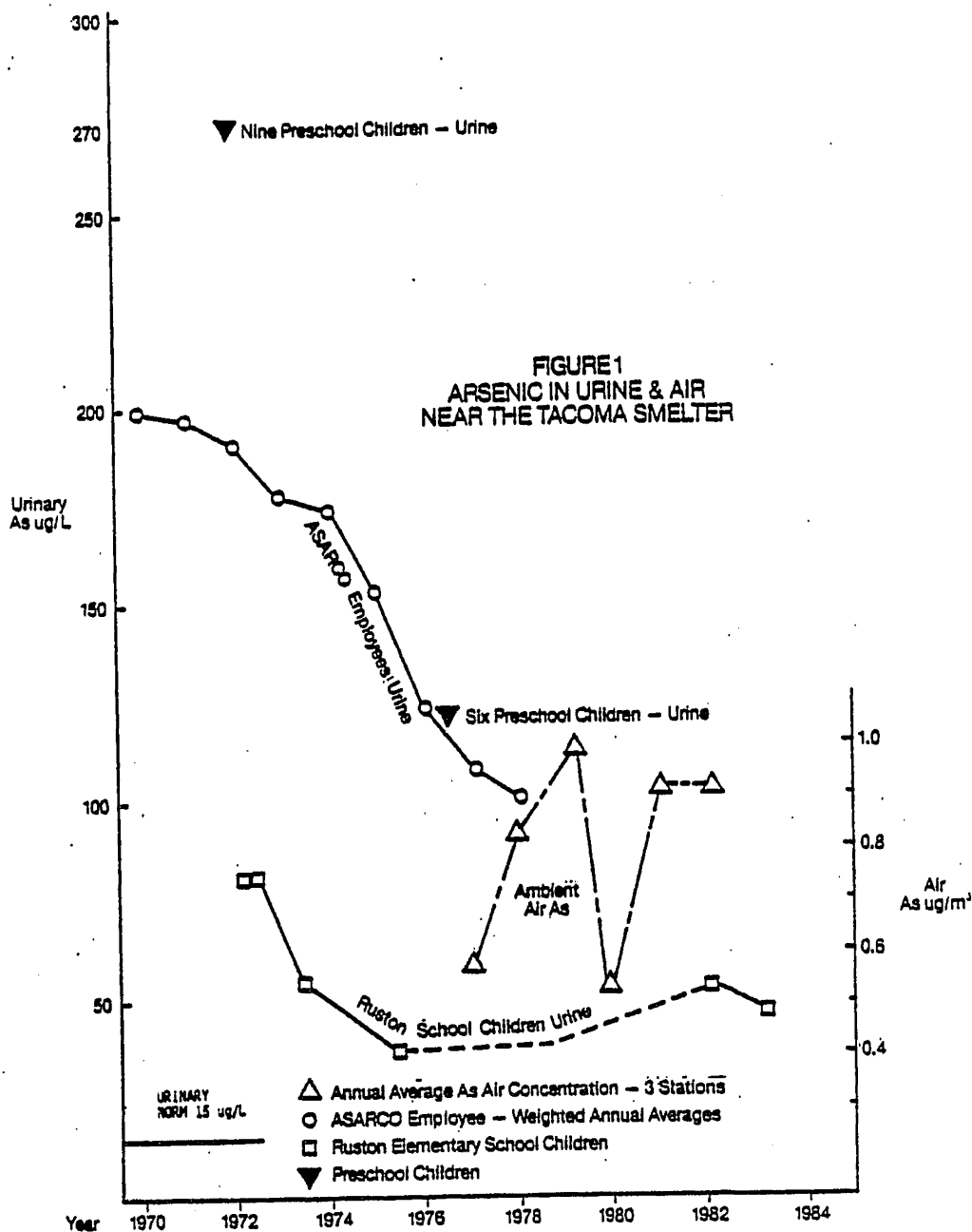
The drop in Smelter worker urinary arsenics shows a strong trend and reflects an annual average of monthly urines for over 500 workers each year. Smelter workers showed a drop of some 50% in their urine concentrations from 1970 to 1978 with most of the drop coming in the last five years when improvements in worker education, protection such as better face masks, protective clothing, clean rooms, hygiene and housekeeping were implemented. The monitoring of urinary arsenic is used to ensure that protection is adequate. ASARCO has determined that it is not possible and/or cost effective to protect employees by the use of engineering controls alone to achieve the federal and state 8-hour Permissible Exposure Level for As of 10 ug/m³ because of high arsenic ores, the production of arsenic and the age of the plant (33). The Quemetco secondary lead smelter on Harbor Island in Seattle has used the same methods to protect workers. The engineering controls are complemented by training and protective actions which reduce both respiratory and oral intake of arsenic and lead at both plants.

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TOXICITY OF HEAVY METALS

Heavy metals exert toxic effects by binding to cell membranes, interfering with membrane function, and by uniting with active sites on membranes. Some of the heavy metals may not only be carcinogenic themselves, but may function as promoters. Promoters can shorten the latency period prior to the development of cancer by intensifying the effect of whatever the initiator carcinogen is. Potential promoters include As, Cd and Pb (36,41).

Carcinogenicity

Fifty percent to ninety percent of cancers in man are caused by chemicals.³⁶ Cigarette smoking alone may be responsible for thirty percent of cancers. Autopsy studies have shown that the body burden increases with age. One's chance of getting cancer also increases with one's age. For some substances, such as asbestos, a solitary exposure to the agent may cause cancer many years later.

Arsenic causes squamous cell skin cancers, angiosarcoma of the liver, lung cancer and possibly lymphoma. EPA calculates that current arsenic exposure in Tacoma causes excess lung cancer (24). Cd is associated with cancer of the prostate and possibly lung (34).

The high traffic volumes such as found in S.P. may be associated with higher levels of mutagenicity in road dust and dust that collects on surfaces children touch (38). Houses in high traffic areas will tend to have more Cd, Pb and BaP in house dust (38).

The toxicities of different mixes of heavy metals can be additive or antagonistic and there is no safe way to predict the net effect now or in the future.

Teratogenicity (Production of physical defects in offspring)

As, Cd, and Pb are all known or suspected to be teratogenic in animals (39). "Of all the classes of chemical compounds, the metals are said to have the greatest potential for embryotoxicity and teratogenicity" (39). Also a synergistic teratogenic interaction occurs between cadmium and lead in animals (36).

One investigator collected hair samples from new mothers and their infants, and concluded that Pb and Cd are transferred across the placenta in man (40).

BEHAVIORAL EFFECTS

Pb has been suggested to cause behavioral disturbances in children (41). Violent behavior may be correlated with increased levels of Pb and Cd in the children's hair (42). Cd and Pb may reduce intelligence quotients in children (43). Even a low level of Pb intake is associated with learning disabilities (44,45). Cd and Pb concentrations in children's hair of 1.72 ppm and 23 ppm, respectively, were linked to learning disability (45). (See hair concentrations in Table I.)

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TOXICITY OF BENZO-A-PYRENE (BaP)

Benzo-a-pyrene is a polycyclic hydrocarbon which is a very potent carcinogen. It induces cancers in animals if painted on the skin or injected subcutaneously. BaP is activated in the body to highly reactive metabolites (epoxides) which bond covalently with DNA. The main source for BaP in man is food, although dietary sources have not been adequately evaluated in studies (5). Some sources in food include: smoked products, meats, charred meat, and crops raised in polluted environments. BaP is found widely dispersed in our environment, and other sources include: water, fuel burning, auto exhaust, and tobacco smoking. It is thought to be the predominant cancer-causing substance in tobacco smoke.

BaP is associated with an excess of respiratory, stomach and prostate cancers when present in urban air (5). Two studies show cancer of the intestinal tract associated with particulate air pollution when no association with lung cancer was found (46). It has been suggested that these cancers came from ingestion of dust that had been contaminated by BaP and heavy metals.

SCREENING AND MONITORING

Biological monitoring is essential for determining current toxic concentrations and metal accumulation in the body, developing strategies for reduction, and confirmation of what strategies work best for each individual. While hair analysis has many limitations and has been abused, it is a cost effective method of screening for accumulation of heavy metals (47,48). It can help in identifying children who have a calcium deficiency that can aggravate the effect of cadmium or an iron deficiency associated with pica (48,49,51). Walsh's work indicates that calcium, magnesium, zinc, Cu, and phosphorus can be monitored with high accuracy and potassium, iron, manganese, Pb and Cd with acceptable accuracy with hair analysis (42). The greater sensitivity of hair analysis to metal accumulation or exposure over a period of time make it possible to clarify the association of low-levels of Cd and Pb intake with learning disabilities, violence and intelligence in children (42,43,45).

Hair is easy to obtain, store, transport and analyze and costs can be as low as \$10 per sample for mass screening (48). However, it does not show current levels in the body fluids. Hair analysis cannot be used without other confirmatory tests where treatment is indicated (48). Uniform quality control standards had not been established when hair samples in Table II were analyzed (1972 and 1975). However, since the 1975 children's hair concentrations for As and Cd were 20 times the population norms and lead and mercury around 3 or 4 times norms, additional screening is prudent.

Urinary As is the method selected by ASARCO and the Washington Department of Social and Health Services to measure exposure of workers and children and seems essential for monitoring of this element.

SUMMARY

Both breathing and ingestion can be important routes of entry of toxic emissions into the body of small children. The lead, cadmium and copper industry has found it cost effective to control oral intake and to protect workers in other ways than to reduce implant air pollution to required levels. These methods may be an affordable way to mitigate the impact of present and past emissions on small children in these contaminated areas.

The house dust from Table I contains high levels as follows:

House Dust (PPM)

	Arsenic	Cadmium	Lead	BaP
South Park	6.4	25.2	1029	.14
Near ASARCO	470	15.9	1329	----

The potential daily intake of a child who eats two grams of road dust or soil from Table II is:

Potential Intake in South Park and Near ASARCO in ug/day

	Arsenic	Cadmium	Lead	BaP
S.P. Road Dust	28	18	1160	.22
Soil Near ASARCO	1722	16	2248	----
Acceptable Intake		10	300	.048

Over 2 or 3 weeks a child who eats more than three grams of soil near ASARCO each day may exceed As intake associated with acute disease (27).

Elevated levels of As, Cd and Pb have been found in air, soil, dust and humans. Preschool children tend to have the highest toxic body concentrations.

The average individual in this country has a one in four chance of developing cancer. Increased intake of As, Cd, Pb, and BaP increases risk of cancer and other disease. It is prudent to do what we can afford to do to monitor and reduce both oral and pulmonary intake.

STRATEGIES FOR REDUCING CHILDREN'S TOXIC INTAKE

We have discussed the known and potential toxicities of chronic low dose exposure to heavy metals and BaP. Since the effects on a growing, young child might be more consequential than in adults, do we not have an added responsibility to monitor and reduce children's exposure to these agents?

We make the following recommendations to the public health authorities and physicians for the contaminated areas within one mile of the Tacoma Smelter and in South Park, Seattle.

- A. Reduce emissions of arsenic, cadmium, lead and BaP.
- B. Screen preschool children and pregnant women periodically for metals under the direction of a physician.
- C. Identify and monitor children of any age who have pica.
- D. Design and implement an educational program for families and the health profession based on a controlled evaluation of the following methods of reducing intake:
 1. Vacuum or clean with a damp cloth all surfaces that a child can touch

once a week. (Floors, rugs, steps, woodwork, furniture, and inside the family car.)

2. Follow the advice of the Tacoma/Pierce and Seattle/King County Health Departments' 1983 booklet titled "Cadmium and Arsenic in Your Garden," in areas near ASARCO.
3. Ensure that children wash before eating. Make it convenient for them to wash before snacking by keeping snacks near the kitchen sink.
4. Clean air ducts once a year and dispose of furnace filters and sweepings in strong plastic bags.
5. Install an efficient door mat at your door. Wipe shoes with a clean damp cloth or leave them at the door when entering the house.
6. Keep doors to attics locked. (Attic dust may present higher hazards.)
7. Reduce air entry into the house. In very tight houses with sources of indoor pollution an air exchanger with a filter may be necessary to maintain indoor air quality.
8. Pave or oil gravel roads, parking lots, driveways, storage areas and road shoulders (25).
9. Plant grass in open areas to prevent access by children with pica as well as reduce mud and dust from tracking (25).
10. Work with a physician to evaluate monitoring data and develop a treatment plan if body burdens are high. A dietary strategy may be needed in cases of nutritional deficiencies. Removal of rugs or relocation should be considered if continued monitoring shows body levels unacceptable to a physician.
11. Shower and change clothes at work if possible if you work in a contaminated area. Place work clothes and shoes in plastic bags to keep children from touching them if you can't change at work. Launder work clothes separately.

Changing personal hygiene habits requires sustained commitment and may not be easy or as attractive as a quick technical fix to reduce toxic intake. The costs of the technical fix of complete control, closing the plant, removing contaminated soil or relocation may not be attractive either. The advice of a physician to a mother reinforced by feedback from biological monitoring, may be one of the most effective ways to change health behaviors. Health authorities are in a position to educate and support families willing to take responsibility for their children's toxic intake.

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